Gas Journal

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Editorial Notes

Ammonia and Tar

In their Annual Reports on Alkali, &c., Works for 1935 both Mr. W. A. Damon, Chief Inspector for England and Wales, and Dr. Birkett Wylam, Chief Inspector for Scotland, record a decrease in the number of by-product sulphate of ammonia processes but an increase in the number of those by which concentrated gas liquor is produced. As far as England and Wales are concerned there has been a decrease of 17 in the number of works registered for the production of sulphate and muriate of ammonia and an increase of 11 in the number of works practising the concentration of gas liquor. In Scotland during 1935 12,500 tons of concentrated liquor (calculated as 15% ammonia) were produced; in 1934 the figure was 10,000 tons, and in 1933 2,000 tons. About 35% of the ammonia produced in gas-works and coke ovens is now concentrated before being fixed. There are indications that the quantity of ammonia products manufactured from gas-works liquors will be still further increased during the current year. Sulphate of ammonia holds pride of place among the nitrogenous fertilizers, but in this connection Mr. Damon suggests that how long it will continue to do so is another matter, for at present, he remarks, there is a distinct tendency to transfer favour to other compounds such as nitro-chalk.

Again due to a policy of centralization, the number of registered tar plants has decreased somewhat. Materials such as creosote oil and naphthalene have shown price increases, and the whole of the production has been absorbed without difficulty. Only a comparatively short time ago some tar distillers were actually using creosote oil as a fuel in order to dispose of it; to-day it enjoys a ready market. Increasing prosperity in chemical industry along with the introduction of new processes of synthesis indicates clearly the important position occupied by coal tar products as a source of raw materials. Pitch is at the moment the black spot of the tar products market; prices have fallen and large stocks are held. In some directions an outlet by way of pitch coke is being sought.

Atmospheric Pollution

In regard to smoke pollution, both Mr. Damon and Dr. Wylam advocate carbonization of raw coal before use in the form of gas or coke—and extension of carbonization would, of course, besides benefiting the health of the community, provide a greater supply of raw material for chemical industry. Smoke—tar and soot—is one form of atmospheric pollution; corrosive gases such as sulphur dioxide are another. Coke and other smokeless solid fuels contain sulphur in proportions similar to that in the coal from which they are derived, and Mr. Damon suggests that the remedy lies in the development of processes for the more complete removal of sulphur from coal prior to its treatment, for the fixation of sulphur in the residual ash, and for the removal of sulphur oxides from the waste gases before they are discharged to atmosphere. "There is," he observes, "a lamentable paucity of data relating to these aspects of the question, and it is very desirable that research on a wide basis should be initiated. Until more information is available there can be no expectation that means for the adoption of sulphur oxide discharge will be widely adopted."

In this connection we recall the article by Dr. G. E. Foxwell on the elimination of sulphur from coke which was published in the "JOURNAL" for Jan. 1 last. In that contribution Dr. Foxwell, who reviewed the work which has been done on the subject, maintained that sulphur in coke is likely to be one of the technical problems of our generation. How to prevent the bulk of the sulphur that will always be contained in coal from entering the atmosphere is admittedly a question easier propounded than solved, though no doubt the substitution of gas for raw coal is the ideal solution. Economics, however, have to be considered. It is possible, though as yet uneconomic, to remove sulphur from coke. The difficulty lies not in finding a workable process but in finding a commercially feasible process. It may be that extension of our knowledge will discover a reagent which will release the sulphur under normal conditions of carbonization or after short treatment with hydrogen. In Dr. Foxwell's opinion it seems more probable that the likeliest method of attack is the somewhat negative one of rendering the sulphur innocuous by discovering means to retain it in the coke upon combustion.

In his last Report Mr. Damon expressed strong views on the emission of "green" gas from coke ovens—"a reproach," he said, "to an industry which prides itself on being progressive and efficient, as, indeed, it is in other respects." He now reports that, greatly to his regret, there has been no general improvement. Yet there is no valid reason why this nuisance should not be materially abated. Another feature of coke oven practice, which has lately increased, gives Mr. Damon cause for anxiety. This is the use of "shock" gas coolers. The trouble arises from the liberation to atmosphere of hydrogen sulphide from the effluent water when it is being cooled. He maintains that steps should be taken

either to " fix " the hydrogen sulphide in the water or to oxidize it to sulphur.

On a later page will be found an extract from the Report giving statistical information of ammonia products manufactured and tar treated in England and Wales and in Scotland during 1935. It will be noted that the ammonia products (expressed as sulphate, 25¾% NH_3) manufactured from gas-works liquor increased from 102,300 tons in 1934 to 109,200 tons in 1935, the corresponding figures for Scotland being 12,269 tons and 13,245 tons.

Use of Geologically Young Fuels

A PLEA for investigation into the possibilities of making town gas from peat—Ireland's native fuel—was made yesterday by Mr. P. J. MacEvoy in his Presidential Address to the Irish Association of Gas Managers. The Address will be found on later pages. In connection with the treatment of geologically young fuels we may call attention to the Paper by Herr W. Allner at the recent Chemical Engineering Congress dealing with " The Manufacture of Town Gas and Gas for Chemical Synthesis from Lignite." It does not appear from that Paper that the Author would advise the use of peat by the methods he describes. Our supplies of lignite are inconsiderable, but, apart from Europe in which there are huge quantities of lignite, extensive deposits are found in North America, in Australia, in New Zealand, and in India. Sometimes these beds extend to a thickness of 100 feet, and the seams are so near the surface that they can be quarried at low cost. Herr Allner's Paper, even in the narrow form implied by the use of the term lignite, is thus likely to be of great importance in other parts of the Empire.

Lignite may have characteristics very close to those of peat, and containing up to 60% of water, or it may range through brown coals to a " bituminous lignite," black in colour with a conchoidal fracture, which contains only 14 to 16% of water. It will not have escaped readers that the non-coking coals of Leicestershire and Warwickshire, to mention no others, contain on air-drying some 10 to 13% of moisture, and are thus not many steps removed from the higher, or geologically older, of the lignites. The oxygen content of these non-coking coals is given by authorities as between 11·5 and 15·5%, while that of lignites, depending upon their geological age, varies between 38 and 10%. In many respects the behaviour of a non-coking coal on carbonization is similar to that of a higher lignite, and methods that will serve for processing one of these fuels will also serve for the other. The time is coming when this country may have to delimit the uses of its coals in order to leave the best coking coals for the manufacture of furnace coke, and industries, like those of gas and low-temperature carbonization, which can use less highly coking coals will either be asked, or compelled, to do so. In many quarters it is regarded as essential that a movement in this direction should be begun forthwith. The price of non-coking slack is less than that of coking slack and some gas-works are already blending the two classes of coals with advantage to their finances and to the quality of the coke.

Gas from Lignites

BLENDING, however, is but a partial solution, if only because the higher the proportion of non-coking coal used, the greater must be the coking power of the coking coal. It is instructive, therefore, from many points of view, to observe the methods that have been introduced on the Continent to deal with lignites. The fundamentals of lignites when used for gas manufacture are that the gas from lignites, when the fuel is carbonized in the ordinary gas retort, is similar to that derived from low-temperature carbonization because the large volume of steam evolved causes the length of time spent in the heated zone to be too small to permit of sufficient decomposition. It will not have escaped gas engineers that Mr. Campbell Finlayson described the art of gas manufacture, in the words of William Young, as " the carefully controlled cracking of hydrocarbons in the presence of hydrogen." This is a peculiarly apt instance of the truth of that dictum. The second important difference between lignite gas and coal gas is that lignite gas contains large amounts of CO_2 ranging, according to figures given by Allner, between 20 and 60% by volume. To make lignite gas suitable for an ordinary gas undertaking a proportion of this CO_2 must be removed and the gas must be subjected to more considerable cracking—to " controlled cracking " so that the extent of its decomposition is just right.

Since non-coking coal corresponds to the very highest grade of lignite, it is hardly likely that either of these difficulties would be encountered to any considerable extent. Nevertheless there would be a tendency for the gases to travel through the cool central portion of the charge—as was pointed out by Mr. Richards when discussing the cannel Paper at the recent Institution Meeting—and that, coupled with the high hygroscopic water content, would tend to produce low-temperature gases. A high CO_2 content is to be expected also, probably in the neighbourhood of 15%, and the removal of this constituent might prove advantageous. It is also to be noted, as a third difference between brown coals and true coals, that the formation of water gas begins at a lower temperature with brown coals than with true coals, and the reaction is more rapid on account of the higher reactivity of the coke. The same is true, though in somewhat lesser degree, of our non-coking coals.

There are many methods by which brown coals may be used. The brown coal may be added to the true coal before carbonization, the low-temperature carbonization products of brown coal may be utilized by subsidiary means to produce gas suitable for town's purposes, or the brown coal may be carbonized directly to produce gas having the required characteristics. This last is clearly the method that is likely to appeal to a gas engineer, and of the methods described in Herr Allner's Paper only one will be mentioned here. This method is selected not only because of its obvious appeal, but also because it embodies that principle of controlled cracking of hydrocarbons in the presence of hydrogen with which we are already familiar in this country.

Carbonizing Brown Coal

THE coal is briquetted and is charged in the ordinary way into continuous vertical retorts, the temperatures used being of the order of 1,000° to 1,300° C. The residual coke is mechanically and continuously discharged into a producer for heating the setting. Instead of allowing the products to travel upwards and out at the top of the retort as is usual in verticals, the outlet is so arranged that the volatile products are compelled to travel downwards a certain distance in the same direction as the charge. At the same time the retort is steamed in the usual way. The heat treatment given to the products converts the gas into the right composition

with the exception of too high a CO_2 content. The gas is scrubbed in three tower scrubbers with a 20% potash lye under normal pressure. A portion of the lye is continuously diverted into a regeneration column in which the bicarbonate formed during washing is reconverted into carbonate and the lye returned again into the circuit. It is not essential to briquette the brown coal before carbonizing, and, of course, it would not be necessary to briquette a non-coking true coal. There is a small yield of tar, about 80 to 90% of the primary low-temperature tar being decomposed, so that the small amount produced resembles high-temperature coal tar. The gas contains benzole which fully corresponds to the standard crude product. When carbonizing brown coal the coke made is used for heating the retorts, but with the higher grade of brown coal there is an excess of coke available for sale. In this event it is briquetted and sold as a smokeless fuel. There is less objection to briquetting than there was formerly, and if a sufficiently high pressure is used upon the raw fuel before charging into the retorts, the carbonized briquettes will retain their shape.

A large commercial plant on this system has been in operation in Hungary since 1932, and another is at work at Kassel. The manufacturing costs of town gas from brown coal depend upon the initial cost of the brown coal in relation to the yield of gas. The figures given in Allner's Paper are quoted here, those in brackets being the equivalent in pence per 1,000 cu.ft. on the basis of 100 pfennigs to 1 shilling. With an average price of 11 Rm. per ton of brown coal briquettes, the cost of gas into holder, assuming a daily output in the neighbourhood of 100,000 m.³ (3½ million cu.ft.), is 2 pf. per m.³ (6·8d./1,000 cu.ft.); to this must be added the capital charges amounting to 0·5 pf. per m.³ (1·7d./1,000 cu.ft.), and the cost of scrubbing the CO_2 from the gas, $\frac{1}{7}$ pf. (0·5d./1,000 cu.ft.).

As we remarked earlier, the importance of this Paper appears to lie in its application to Empire deposits of lignite, and in the impetus which it may give to the study of the use of parallel methods for dealing with non-coking coals in this country.

Extensions at Lincoln

Only a short time ago we commented in these columns on the extraordinarily rapid progress which has been made by the Lincoln Gas Department since Mr. George Wright was appointed Engineer and Manager in 1930. Since that time the undertaking has been veritably transformed. New storage capacity has been installed, the works have been entirely reconstructed, a new gas distribution centre has been built up, and modern selling methods have been adopted. The result of all this has been to place the Department in a secure position to withstand competition and largely to extend its activities. The new equipment, too, has had an important effect on municipal opinion in the City. It has altered the outlook of those who were gaining the idea that the prospects of gas were waning; trepidation has given way to confidence, and the Department is going ahead by leaps and bounds. Industrialists in the district have been convinced of the merits of gaseous fuel and are converting their plants to gas firing, and during the past twelve months the increase in the industrial load amounted to over 11%. To obtain a perspective of the position Mr. Wright issued a questionnaire to the various firms using gas, asking them to try to forecast their approximate future requirements, and the replies indicated that in the next two years the industrial load will be equivalent to half the present output of gas—300 million cu.ft.

Last week the Lincoln City Council approved a scheme for extending the plant at the Bracebridge Gas-Works, and application is to be made for consent to borrow £23,000, the estimated cost of the additions. At the meeting of the Council, it was explained by the Chairman of the Gas Committee that the new plant erected in 1931 raised the productive capacity from 2,000,000 to 3,000,000 cu.ft. per day, and this, based on past experience, would have been equal to the requirements of the City for the next 20 years. However, the monthly increase at the present time exceeded what previously constituted the yearly increase, and the recommendation was for an installation giving a total gas production of 4,500,000 cu.ft. per day. A jump from 2,000,000 to 4,500,000 cu.ft. a day in the short period of six years is, we suggest, worthy of record. It is the outcome of enthusiasm and enterprise. Mr. Wright's keenness and his belief in gas have accomplished much already, and have paved the way for great future developments in the Lincoln area.

Welcome Publicity

Except for the publicity on the rare occasions when gas is the source of accident, we have had reason to complain of the indifference of the Daily Press to the progress and achievements of the Gas Industry—the more so in view of the assidious attention devoted to the doings of the electricity industry. It gave us singular pleasure, therefore, to find in the *Financial Times* of Aug. 4 a well displayed and lengthy article expressing in no uncertain terms belief in the stability of our Industry as a medium for investment, and assured faith in its continuous prosperity. The article in question was concerned with the investment merits of shares in the chief gas companies, and pointed to the fact that with but one or two exceptions dividends on the ordinary stocks have been maintained throughout the worst phases of the depression and in some instances have actually been increased —and no one will deny that the past seven years have been a rigorous testing time for all industries. Gas undertakings have emerged from this test with honours. Moreover, the achievement is all the more striking having in mind that the period has been one of unprecedented capital expenditure on new appliances consuming less gas for equal service and on mains and services supplying uncongested housing estates and new territory. These development plans have been costly, but they are a security for the future.

The satisfactory character of gas sales during this period and the maintenance of such excellent financial results are attributed by the writer to the ability of gas undertakings to effect substantial reductions in manufacturing costs by "unceasing scientific research and the application of the highest attributes of organization and management." It is occasionally pleasant to bask in the sun of appreciation, and it is uncommon for the sun to shine so strongly on the Gas Industry. "Quaestor," who contributes the article in the *Financial Times*, remarks that "among other purposes gas represents an *indispensable* means of solving heat treatment problems . . . and offers an expanding market for many years to come." The italics are ours. Nor is competition forgotten: "The Industry has made continual progress in face of the remarkably active electrical development of the past few years. It has clearly demonstrated its ability to hold its own. Gas occupies a dominant

position in the cooking and heating fields, and one cannot envisage the possibility of the country-wide distribution of electricity at so low a price as to oust it." Discussing the Gas Industry from the point of view of the investor, "Quaestor" remarks that, in view of the heavy expenditure by gas companies on development, sales stimulating policies, and the increased cost of coal, it would be unwise to budget for an increase in distribution rates in the near future. "But," he says, "future years should see higher dividend rates as the spending power of the community grows and average cost of production as a result of increased make and other factors further declines . . . . Generally speaking, shares in gas companies may be regarded as assuring a continuance of substantial dividends with the probability of an increased return at some future date."

The bills of the *Financial Times* throughout the London area, and, we assume, in other districts, featured the article by "Quaestor," and we trust that it will have been the means of subduing electrical hysteria.

Training for Management

AT a time of great industrial activity like the present, one must be more than ever impressed with the vast changes that have come about in methods of work during recent years. How many operations which were simple are now complicated; to what a large extent has the power of the arm had to make way for alertness of the mind. "Speeding-up" takes its toll, and industrial work, though less laborious, has become far more exacting mentally, than in days gone by. Here is an example, from the 1935 report of the Chief Inspector of Factories and Workshops, who, referring to the wholesale clothing trade in Leeds, says: "The outstanding feature of the year is the introduction, either in full or in modified form, of the 'conveyor system,' under which a garment is passed by means of a conveyor to successive workers, each of whom performs one small operation upon it. . . . Concurrently with the introduction of this system, one firm at least has introduced a greater degree of specialization generally, and each worker is trained to do one part of a garment, so that her speed is increased to its maximum."

In other industries also one finds evidence of this specialization, which renders it essential that unduly long hours should not be worked—rather, indeed, that they should be shortened as far as possible. "The adverse effect of long hours is sometimes realized when employers admit that their workers, like their machines, may reach a fatigue point." It is considerations of this character which have been responsible for the introduction by certain firms of the five-day week, regarding which it is said that "those who have tried it for some time are loath to make any change."

The altered conditions and their implications are well summed up by the Industrial Health Research Board in their annual report, where they say it has now become clear that the day of brawn and muscle is over, and that the present demand is for alert, smart, active men, more prone than their predecessors to "errors of the mind." Such men, the Board point out, "are more adaptable to the needs of modern industry, but they are also more responsive to variations in their environment, more aggressive, quicker to make trouble and to demand their rights, and—more liable to forget their duties. The modern manager of a labour force must be awake to the changes, physical and mental, which are taking place. He can no longer be a dictator, or afford to be tactless. Many investigations done by the Board point to the conclusion that if selection and training are needed anywhere they are needed for management." Undoubtedly, modern methods have brought to the manager of employees new and greater responsibilities, demanding special qualifications. This should ever be borne in mind by the managers themselves and by those in whose service they are engaged, in order that these added responsibilities may be duly recognized on both sides.

Personal

Mr. A. E. WHITCHER, Engineer, Manager, and Secretary of the Haywards Heath District Gas Company, has been elected to a seat on the Board. Mr. Whitcher will in future act in the capacity of Managing Director.

Other Directorships which Mr. Whitcher holds are of Associated Gas and Water Undertakings, Ltd., the East Surrey Gas Company, the Steyning Gas Company, the Alresford (Hants) Gas Company, the Kirton-in-Lindsey (Lincoln) Gas Company, and the Hassocks Gas Company. The appointment marks in a signal manner his eighteen years of sterling service with the Company whose sales have risen from 50 million cu.ft. in 1918 to 146 million cu.ft. last year.

* * *

It is announced that Mr. A. G. FOSTER, M.I.Mech.E., has been appointed Director and General Manager of J. Browett Lindley (1931), Ltd., and General Manager of the Campbell and Coborn Engine departments of Kryn & Lahy (1928), Ltd.

* * *

Mr. HAROLD JACK, the Deputy Gas Engineer at Southport, who has been appointed to the position of Gas Engineer to the Ilkley Urban District Council, has been presented with parting gifts by the staff of the Southport Undertaking. Mr. Jack has served the Department for 21 years, rising from a junior to his present position. Mr. J. Herbert Clegg, Engineer and Manager, in making the presentation, expressed the hope that Mr. Jack's future would be a very happy and prosperous one.

* * *

We learn that Mr. E. N. FARNWORTH, Assistant Gas Engineer to the Oswaldtwistle District Council, has been appointed Assistant Gas Engineer to the Lytham St. Annes Corporation. He served his articles with Mr. A. F. Ames, Engineer and Manager, Burnley Gas Department, and during his connection with the Oswaldtwistle Undertaking the Works have been reconstructed and new types of plant introduced. Mr. Farnworth holds a First-Class Higher Grade Gas Engineering Certificate, and is an Associate Member of The Institution of Gas Engineers.

Correspondence

Therm Meters

SIR,—In your issue of July 29 a letter appears regarding the therm meter, by Mr. W. Templeton, Chief Inspector, City of Leeds Gas Meter Testing Station.

Having taken rather a keen interest in the above subject, I would like to point out that recently I provisionally protected a prepayment mechanism attached to a single meter to register both therms and cubic feet, also gas units. The construction of the mechanism is such that it can be set to register for any declared calorific value, and for gas units at 4,000 B.Th.U. per unit up to 100,000 B.Th.U. This mechanism is of the optional type, taking pennies or shillings. The part of the mechanism indicating therms is incorporated in the prepayment attachment, and change of thermal dials could thus be effected without interfering with the Government stamp. This part can be adapted also for insertion in an ordinary meter along with the volumetric index, in which case the dial of this said part could be fixed outside an ordinary meter facing the front, with a suitable cover over the dial and mechanism pointer.

Yours, &c.,
ROBERT KAY GIBSON.

1, *Bangholm Park,*
Trinity,
Edinburgh, 5.
July 31, 1936.

News in Brief

A Reduction in the price of gas at Montrose by 2½d. per 1,000 cu.ft. is to become operative in October. The new price will be 3s. 8d. per 1,000 cu.ft.

A Change of Declared Calorific Value is announced by the Tredegar Urban District Council in the current issue of the *London Gazette*. On and after Jan. 1, 1937, they intend to supply gas of 430 B.Th.U. per cu.ft.

Application for a Special Order under the Gas Undertakings Acts, 1920 to 1934, is intended to be made to the Board of Trade by the Bilston Gas Light and Coke Company with the object *inter alia* of raising additional capital.

Five-Year Contracts for Street Lighting by gas have been approved for Welshpool (about 116 lamps) and Stirling (about 334 lamps). A seven-year contract is to be adopted by the Brightlingsea Council; about 176 lamps are involved.

Tenders are Invited by the Halifax Corporation Light, Heat, and Power Committee for a new gasholder and extension of the existing holder. The other existing holder, which has been in use more than sixty years has been put out of service.

A Further Reduction in the price of gas is to take place in Perth. It was agreed by the Gas Committee and the Finance Committee on Aug. 3 to recommend a reduction of 1d. per 1,000 cu.ft. The price for domestic use will now be 3s. 1d. per 1,000 cu.ft., with an additional 2d. per consumer from prepayment meters.

Miss Josephine A. S. Wyles, B.Sc., has been appointed to the Cookery Demonstration Staff of the Liverpool Gas Company, and will begin her duties in Liverpool on Sept. 1. The Liverpool Gas Company have now three Senior Demonstrators in Miss J. Powell Williams, Miss Joyce P. Nicholson, and Miss Wyles.

A Revised Scale of Charges for gas has been approved by the Southport Corporation: First 4,000 cu.ft. per quarter, 3s. 3d. per 1,000 cu.ft.; next 6,000 cu.ft., 3s.; next 10,000 cu.ft., 2s. 9d.; next 85,000 cu.ft., 2s. 6d.; next 105,000 cu.ft., 2s. 3d.; next 240,000 cu.ft., 2s.; next 300,000 cu.ft., 1s. 9d.; next 750,000 cu.ft., 1s. 6d.; and all in excess at 1s. 3d.

We Have Received from the publishers, Messrs. Andrew Reid & Co., Ltd., Strawberry House, Newcastle-upon-Tyne, a copy of "Reid's Handy Colliery Guide" for Northumberland, Durham, Yorkshire, Cumberland, and Westmorland. The favourable reception accorded to the former issues of this publication proves in a practical manner the need for such a work.

The Price of Gas in Glasgow is to be reduced by a further 1d. per 1,000 cu.ft. This was approved at a meeting of the Gas Committee on Aug. 7. It is the third consecutive annual reduction. A reduction of 1d. means a saving to consumers of approximately £38,000 per annum. The amount of reductions given to consumers since 1934-35 now aggregates approximately £250,000 per annum. The new charge for 1,000 cu.ft. will be 2s. 11d.

A Five-Year Lighting Contract has been entered into with the Dawley Gas Company by the Dawley Urban Council.

The Co-Partnership Magazine of the Hastings and St. Leonards Gas Company for August contains an interesting photograph of the crown of one of the Hastings holders on which the words "HASTINGS GAS SERVICE" are painted in letters many feet in length.

Tenders Were Submitted at a special meeting of the Bury (Lancs.) Gas Committee on Aug. 4. These had been received for the supply of a benzole recovery plant. The Committee resolved that it be a recommendation to the Finance Committee to raise the sum of £7,500 for the purchase of the new plant, and at a meeting of the Finance Committee on Aug. 6 the recommendation was approved and the Town Council were asked to instruct the Town Clerk to make application to the Ministry of Health for sanction to borrow this sum.

A Final Winding-Up Meeting of Elie and Earlsferry Gas Company, Ltd., which has been purchased by St. Andrews Gas Comapny, was held on Aug. 7 in the office of Messrs. D. and A. Cook, Solicitors, Elie. Mr. W. Jamieson presided. The liquidator's report, showing how the winding-up of the Company had been conducted and its property disposed of, was submitted, and it was resolved that the books, accounts, and other documents of the Company be handed over to St. Andrews Gas Company. Mr. Jamieson was thanked for his long and faithful service as Chairman of the Elie Gas Company.

A Decision to Take a Referendum of the ratepayers of Alnwick has been rescinded, and the whole question of a lighting contract has for the meantime been left in abeyance. The Alnwick Gas Company has had instructions to put the gas lamps in commission again for the coming lighting season on exactly the same conditions as in previous years but with no guarantee for any length of time. The rescission was made on two grounds. Firstly, because the estimated cost of £50 was not justified, and, secondly, in view of the Government's pending legislation on the maintenance of main roads it served no useful purpose. Until the Government decision was applied in detail it was just as well to continue the experimental lighting.

Work Began on Aug. 5 on the Bradford Corporation's new gasholder, which is to be of 2,250,000 cu.ft. capacity, the biggest yet erected at Bradford. It is part of the Department's £190,000 centralization scheme at the Birkshall Works. The site, formerly used for coke storage, is over old shallow coal workings some 10 ft. below the surface, and involves the construction of fifty-five concrete piers sunk to rock level for the foundations, and a circular reinforced concrete base for the holder, 167 ft. in diameter, and from 8 to 19 in. thick. The holder's tank will be 164 ft. diameter and 32 ft. deep, entirely of British mild steel, and will hold 4 million gallons of water. The holder will be of four lifts and 155 ft. 3½ in. in height when fully inflated.

Gas Journal Shewring Fund

Donations are invited to the Fund, full particulars of which were given in the "JOURNAL" for July 22. The Management of the Fund is in the hands of Messrs. F. G. Shaw (Buxton), W. W. Townsend (Colchester), and J. Bridge (Elland). All expenses having been guaranteed, the whole of the sums received will be applied, without any deduction whatsoever, to the benefit of the widow and children of Harold Shewring, by whose tragic death earlier this year they were left in distressed circumstances.

Cheques should be made payable to the "GAS JOURNAL," and crossed "Shewring Fund Account." All donations will be gratefully acknowledged by the Editor, who is Treasurer to the Fund.

Forthcoming Engagements

Aug.

28.—I.G.E.—Gasholder Committee at 2.30 p.m.

Sept.

8.—N.G.C.—Meeting of the Central Executive Board.
10.—North British Association.—Annual Meeting at Kirkintilloch.
14.—I.G.E.—Research Executive Committee at 2.30 p.m. [Transferred from Sept. 1.]
24.—Wales and Monmouthshire Association.—General Meeting at Porthcawl.
25.—North of England G.M.A.—Autumn Meeting at Middlesbrough.

Oct.

3-6.—B.C.G.A.—Jubilee Conference at Bath.

Nov.

3 and 4.—I.G.E.—Autumn Research Meeting.
26.—I.G.E.—Advisory Committee on Research at 2.30 p.m.

N.B.—*There will be no Meetings of the Central Executive Board of the National Gas Council or of the Central Committee of the Federation of Gas Employers during August.*

Amalgamation and Grouping

Northampton, Newport Pagnell, and Olney.

It was announced at the annual meeting that the Northampton Gaslight Company had entered into an agreement which was subject to the approval of the shareholders of both Companies for the acquisition of the Newport Pagnell Gas and Coke Company. A Board of Trade Order is being applied for to carry the agreement into effect and also to acquire the Olney Gas Light, Coke, and Coal Company, in which, as already announced in the "JOURNAL," the Northampton Company had acquired a controlling interest.

World Power Conference

British Papers

The following are included in the Papers which are to be presented by the British National Committee of the World Power Conference at the Conference to be held in Washington between Sept. 7 and 12:

THE PROCESSING OF COAL.

Authoritative Body: Fuel Research Station, Department of Scientific and Industrial Research.

Author: Dr. J. G. King, Ph.D., A.R.T.C., F.I.C., Chief Chemist, Fuel Research Station.

Authoritative Body: Coke Oven Managers' Association.

Author: T. Westthorp, A.M.I.Chem.E., President, Coke Oven Managers' Association.

ORGANIZATION OF THE PRODUCTION, TRANSPORTATION, AND DISTRIBUTION OF MANUFACTURED GAS AND GAS BY-PRODUCTS.

Authoritative Body: British National Committee of the World Power Conference.

Authors: R. W. Hunter, M.Inst.Gas E., Chief Engineer, Gas Light and Coke Company, and Dr. G. W. Anderson, F.I.C., of the Engineering Staff, Gas Light and Coke Company.

ORGANIZATION OF PRIVATE GAS UTILITIES.

Authoritative Body: National Gas Council of Great Britain and Ireland.

Author: Leslie F. Stemp.

PUBLIC REGULATION OF PRIVATE GAS UTILITIES.

Authoritative Body: National Gas Council.

Author: Leslie F. Stemp.

ORGANIZATION, FINANCING, AND OPERATION OF PUBLICLY-OWNED GAS UTILITIES.

Authoritative Body: National Gas Council.

REGIONAL INTEGRATION OF GAS UTILITY FACILITIES IN GREAT BRITAIN.

Authoritative Body: British National Committee of the World Power Conference.

Author: Dr. C. H. Lander, C.B.E., D.Sc., Vice-Chairman, British National Committee of the World Power Conference; Professor of Mechanical Engineering, City and Guilds (Engineering) College.

RATIONALIZATION OF DISTRIBUTION OF GAS IN GREAT BRITAIN.

Authoritative Body: British National Committee of the World Power Conference.

Author: George Evetts, M.Inst.C.E., M.I.Mech.E., M.I.Gas E., M.Cons.E.

Ammonia and Tar in 1935

Alkali Works Report

In our Editorial Columns to-day we refer to some of the findings of the Chief Inspectors of Alkali, &c., Works in their Report for 1935 (H.M. Stationery Office, price 9d.). The following information is extracted from the Report.

TABLE I.—*Ammonia Products Manufactured in England and Wales*

[Expressed as Sulphate (25¾% NH_3)—Tons.]

From Liquor Produced in—	1935.	1934.	1933.
Gas-works	109,200	102,300	89,500
Other works (including coke ovens, iron works, producer gas, synthetic, &c.)	461,700	458,700	557,500
Total	570,900	561,000	647,000

NOTE.—Of the above total, the equivalent of 85,400 tons was manufactured as concentrated liquor, and 26,400 tons of this concentrated liquor was subsequently converted to salts, which are included in the 570,900 tons above. The total quantity of salts of ammonia produced, therefore, was 485,500 tons and the net production of ammonia was 544,500 tons.

TABLE II.—*Tar Treated in England and Wales—Tons.*

Origin.	Tar Distilled.	Pitch Produced.
Gas-works	1,024,200	261,000
Coke ovens	603,000	228,100
Other works	23,100	8,400
Total	1,650,300	497,500

NOTE.—Of the above total quantity of tar, it is estimated that 935 800 tons were distilled for the production of pitch, the balance of 714,500 tons being treated only for the preparation of road tar, &c.

TABLE III.—*Salts of Ammonia, expressed as Sulphate, Manufactured in Scotland.*

—	1935.	1934.	1933.
	Tons.	Tons.	Tons.
Gas-works	13,245	12,269	11,205
Iron works	215	295	230
Coke ovens	7,404	6,392	3,751
Shale works	25,398	25,240	25,269
	46,262	44,196	40,455

NOTE.—Included in these totals are 1,044 tons recovered as liquor ammonia, and 87 tons as ammonium chloride.

TABLE IV.—*Tar Made in Scotland.*

—	Tar Distilled. 1935.	Pitch Produced. 1935.	Tar Distilled. 1934.	Tar Distilled. 1933.
	Tons.	Tons.	Tons.	Tons.
Gas-works	130,067	27,621	134,979	137,548
Iron works	4,932	3,227	3,298	1,898
Coke ovens	20,509	6,632	19,985	13,089
Producer gas	127	55	117	408
	155,635	37,535	158,379	152,943

Improved Gas Lighting in Chelsea

Thirteen Main Traffic Routes Involved

The Chelsea Borough Council has entered into a 15-year agreement with the Gas Light and Coke Company for the lighting by gas of thirteen main traffic routes and the side streets throughout the Borough.

Contemplated improvements include the raising of the standard of lighting of all main traffic routes to comply with the report of the Ministry of Transport Departmental Committee on Street Lighting, the conversion of all 2-light to 3-light lamps, and the fitting of special reflectors. The illumination in all side streets will be doubled. Other London Boroughs which have entered into 15-year agreements for gas lighting are Westminster, Holborn, Paddington, and Southall-Norwood.

National Smoke Abatement Society

Programme of Eighth Annual Conference

The Eighth Annual Conference of the National Smoke Abatement Society is to be held at the Science Museum, South Kensington, from Oct. 14 to 17 next, under the Presidency of Mr. H. A. Des Voeux, M.D.

The Conference will be opened at 10.30 a.m. on the Wednesday by Capt. H. Crookshank, M.P., Secretary for Mines; and a very comprehensive programme has been arranged for the various sessions. The first session, immediately following the opening proceedings, will be devoted to a Paper by A. T. Barber and T. F. Hurley, of the Fuel Research Station, on a Review of Methods for the Prevention of Grit and Dust Emission, especially from Pulverized Fuel Furnaces. On the Wednesday afternoon will be Papers on Modern Methods of Dealing with Smoke Prevention Problems in the Iron and Steel Industry, by H. C. Armstrong; and Problems of Smoke Emission in the Clay Industries, by A. T. Green.

In the third Session on the Thursday morning will be Papers on the Solution of the Domestic Smoke Problem, by Dr. Margaret Fishenden; and Through a Glass Darkly, by Noel Carrington. After lunch, Sir Arthur Hill will discuss the Effect of Atmospheric Pollution on Vegetation, while J. S. Owens will follow with a Paper on Developments in the Investigation of Atmospheric Pollution.

The fifth session, on Friday, Oct. 16 (Health and Municipal Day) will be devoted to Addresses by such well-known experts as Sir Pendrill Varrier-Jones, Sir Henry Gauvain, and Sir Leonard Hill. This session will be entitled "Smoke, Light, and Health." In the sixth, and final,

session, on the Friday afternoon, Papers will be presented by A. S. M. MacGregor on Public Health Administration and Smoke Abatement, and by H. G. Clinch on Smoke and the Sanitary Inspector. On the Saturday morning at 11 a.m. will be held the Annual Meeting of the Society, open to members and representatives of affiliated associations and local authorities.

In conjunction with the Conference, a Smoke Abatement Exhibition will be held at the Museum, where among the exhibits is to be a display by the London and Counties Coke Association.

Territorials in Camp

Tribute to Gas Light and Coke Company's Keenness

A splendid tribute to the keenness of the 12th London Regiment (the Rangers), 80% of whose rank and file and 50% of whose officers come from the Gas Light and Coke Company, was paid by Major-Gen. A. C. Temperley, Military Correspondent to the *Daily Telegraph*, writing in that newspaper last Friday.

Major Temperley was referring to the presence of the 3rd London Infantry Brigade, under the command of Col. E. W. S. Balfour, in camp at Seaford. Only one of the four regiments was more than 200 strong, and that regiment was the Rangers, who had the excellent muster of 400. The writer observed that the members of the Gas Light and Coke Company receive full pay while in camp, which does not count as part of their holidays. In indirect ways, also, he remarked, this patriotic firm gives much assistance. Its buildings are used as a drill hall, and its engineering resources are drawn upon by the battalion. He saw the Rangers practising a battalion in attack over typical downland in preparation for the inspection the following day, and so keen were they on new weapons that they brought with them gas-pipe models of the Bren gun and the mortar, which can be used for tactical purposes.

Gas Publicity in the Orient

The above photograph is reproduced from a strikingly coloured and executed poster which was sent to us by Mr. Y. Toyoshima, of the Japanese Gas Engineers' Association, of Tokyo, and provides interesting evidence of the up-to-date publicity methods employed on behalf of gas in the Far East. Though we are, unfortunately, unable to translate the captions, the underlying idea of the poster is obvious, showing as it does a comparison between the old and the new methods of cooking in the Japanese kitchen.

The "Adastra" Sectional Steel Pole

Suitable for Gas Lighting

The "Adastra" pole affords a design which meets modern demands in being mathematically correct, manufactured by quantity-production at an economic level, and highly resistant to corrosion inside and out; while it can be transported, assembled, and erected with the minimum expenditure of time and labour. "Adastra" poles are claimed to be considerably lighter than other forms of pole; yet the high tensile steel, elliptical section, and correct proportioning make them of ample strength.

The essential feature of "Adastra" poles lies in the fact that they are constructed of individual tapering sections, each two metres long, and having an elliptical cross section.

From fourteen standard sections, no less than fifty-four different types of single-member poles can be constructed, while by the employment of a standard coupling a great variety of "Duo" or "H" poles can be built.

The sections of an "Adastra" pole can be nested together for transport. When nested, the cubic capacity of any size of pole is only that of the bottom or largest section. Thus a 50 ft. pole when nested for transport is only 6 ft. 6 in. long, a saving of nearly seven-eighths of its original length. A 30-cwt. motor truck will accommodate no fewer than twenty of these poles, each 35 ft. in length before nesting. Storage problems are also simplified to a remarkable degree, and 300 of these poles can be stored under cover in a space 6 ft. 6 in. long by 10 ft. wide by 5 ft. high. They can all be man-handled—a man can easily carry a 30 ft. pole, and no expensive mechanical equipment is necessary.

The installation of an "Adastra" pole is a matter of extreme simplicity; upon arrival at the site the sections are withdrawn from the nest and assembled by telescoping them together. They are tightened by the use of a simple device consisting of a steel cable and screw straining gear operating through the centre of the pole. The sections are pulled together until the pole is of the specified length, the overlap at the joints being approximately equal to the major axis of the section. The fittings are then mounted, and the pole is ready for erection. If the cross arms or brackets are of the "Adastra" tubular sleeve type their assembly is a matter of seconds—they are merely slid over the top of the pole and are firmly and accurately located on the tapering pole section. The illustration shows "Adastra" gas lighting standards recently erected at Leek.

An attractive and informative catalogue has been issued by Poles, Ltd., which deals comprehensively with the subject and which can be thoroughly recommended to all those interested in overhead transmission, lighting standards, &c.

Sheffield's New Gasholder

A Striking Comparison

The cathedral can be a forceful standard of size, and while we know that there are in existence to-day not a few gasholders which would dwarf in height many major cathedrals, we have to thank the *Sheffield Daily Telegraph* for a striking comparison between the new gasholder to be built by the Sheffield Gas Company and St. Paul's Cathedral.

This striking pictorial-diagrammatic study appears in their issue of Aug. 8 and shows that the gasholder is as high as the top of the dome of St. Paul's Cathedral. The holder

is to be built on the site of the new Works at Wincobank. On the crown of this large holder will be painted in white letters, 15 ft. or 20 ft. long, the name "SHEFFIELD" as a guide to airmen crossing the district.

This, we understand, will be the largest spirally-guided gasholder in the world and its erection has been made necessary by the great increase in gas supplied by the Sheffield Gas Company.

Messrs. Newton Chambers & Co., Ltd., of Thorncliffe, have obtained the contract to erect the holder. Work on it has commenced and is due for completion in about twelve months' time.

The holder, which will be of the four-lift type, when fully extended will reach to a height of 240 ft. Its capacity will be 8 million cu.ft. In the building of this holder, and the accompanying base tank, 3,500 tons of steel plates will be used, sufficient to cover an area of nearly seven acres. Some 1,500,000 rivets will be required.

The plates will be prepared and drilled in the steel constructional shop at Thorncliffe and then transported to the site for building. The bed here has already been prepared, the process necessitating the excavation of 16,000 cu.yd. of ground. Messrs. Newton Chambers, by the way, also had the contract, now nearing completion, for constructing the purification plant for the new Wincobank works.

All the steel used for the new holder will be British made, and the bulk of the plates will be rolled at the works of the Park Gate Iron and Steel Company, and at the Appleby works of the United Steel Companies.

Canadian Gas Association

The 29th Annual Convention of the Canadian Gas Association and North-West Conference of the Pacific Coast Gas Association, held at Vancouver on July 8-10, was a great success, with a record Registration of Delegates.

The Annual Elections for Officers of the Canadian Gas Association resulted as follows:

President.—W. H. Munro, General Manager, Ottawa Gas Company.

1*st Vice-President.*—E. J. Tucker, Assistant General Manager and Secretary, Consumers' Gas Company, Toronto.

2*nd Vice-President.*—T. P. Pinckard, Vice-President and General Manager, United Gas and Fuel Company of Hamilton, Ltd.

Secretary-Treasurer.—G. W. Allen, Gas Survey Engineer, 183, Glengarry Avenue, Toronto.

The new constitution and by-laws of the Association, allowing for representation of all interests supplying gas of whatever kind for public consumption, and which also consolidates the whole Gas Industry in Canada, was fully endorsed by the Convention.

Athletic and Social

South-Eastern Gas Companies' Tennis Tournament.

The following are the results of the Second Round of the South-Eastern Gas Companies' Tennis Tournament: East Kent beat Sittingbourne. Hastings beat Dover.

William Sugg & Co.'s Annual Outing.

On Saturday, June 27, the staff of William Sugg & Co., Ltd., were entertained by the Directors to a very enjoyable day at Cliftonville. The party was conveyed by special train from Victoria, and luncheon was served at the Grand Hotel, where full honours were accorded to the Loyal Toast and to that of the Company and its Directors. The event was favoured with glorious weather; tea was served at the Grand Hotel, and in the late evening the large party returned to London after a very happy day. The ladies of the staff were entertained at Brighton.

Gas at the Royal Lancashire Show

A splendid gas exhibit was staged by the Blackpool and the Lytham St. Annes Corporation Gas Departments, in conjunction with the B.C.G.A., at the Royal Lancashire Show held at Blackpool from July 30 to Aug. 5.

Fine Display at Blackpool

The stand, 100 ft. long by 15 ft. wide, was divided, as will be seen in the accompanying photograph, into a series of separate sections. The first was devoted to a display of Ascot gas water heaters, with a tiled bathroom and kitchen sink. A prominent feature was a cascade of continuous running hot water produced from three sink heaters, the water pouring on to glass shelves behind which coloured electric lights flashed. The current for these lights was generated on the stand by a Köhler gas-electric plant.

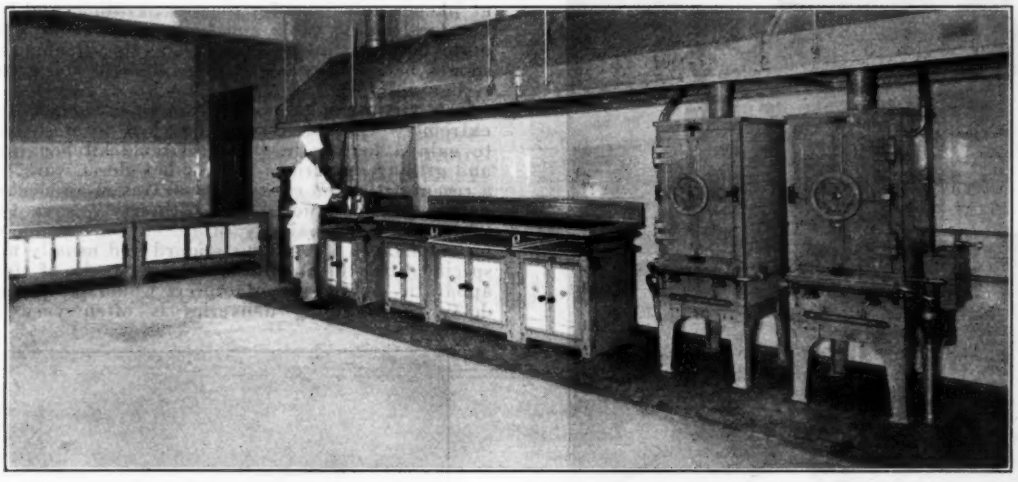
A large space on the stand was devoted to hotel appliances, and, incidentally, coffee was provided free for visitors. Also shown in this section were large-scale cookers and a "Guesthouse" cooker which is so constructed as to allow other units to be added when increased demand calls for it. A gas griller and a vegetable steamer were also displayed. The next section was given up to central heating equipment and a range of Ideal gas and coke fired boilers were displayed.

A spacious information bureau occupied the centre of the stand, and copies of recent gas literature were available to the public. In the centre of the back wall was a display depicting the spirit of coal in home and industry. A platform was provided on the front of this exhibit, on which was fixed a cooker and a turbine washing machine with which demonstrations were conducted.

The next section was devoted to a working exhibit of a gas baking oven. Tea cakes, scones, sponges, buns, and fancy cakes were prepared and baked and distributed freely among the crowds. In the next section was a display of modern gas fires, each one in an appropriate setting—panel fires, hall-heaters, and clinical lamps.

The story of refrigeration by gas was told in the next room, and beside a stripped unit was set a complete range of Electrolux refrigerators, each of which was working. Ice cream made by the chef was frozen in these and distributed to the public. The end of the stand was devoted to a scientifically planned kitchen, complete with gas cooker and drying cupboard, and here the clothes washed by the demonstrator on the front of the stand were dried and ironed before interested audiences.

Gas for Hotels and Restaurants



A very large gas kitchen is that in the Alexandra Palace, which caters for visitors and provides meals at the times of special exhibitions. Part of the equipment is illustrated.

Hotel and restaurant business is not only directly profitable to the gas undertaking. It has also an advertising value that may mean other business. An attractive gas fire in a hotel bedroom, a coke fire, gas-ignited, in the lounge, a neat gas radiator in an angle of the stairs—these may convince visitors that they could bring equal comfort and convenience to their own homes.

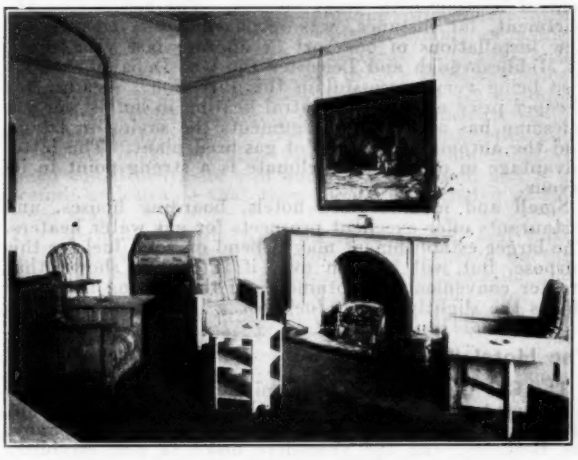
A Profitable Load

In effect every installation in a hotel or restaurant should be a convincing piece of propaganda for gas. Can it be said that this is so? Are there no hotels in the bedrooms of which are contraptions, "modern" gas fires perhaps at the time they were bought, but now out-of-date and calculated to set the visitor against the use of gas, not predispose him in its favour? If any such do exist, it is up to gas undertakings to see that they are eliminated as quickly as possible. In this connection a little "consumer research" among smaller private hotels would not be a waste of time in all probability.

The Bedroom Gas Fire.

Modernization of the bedroom gas fire is an easy job, and it need cost the proprietor hardly anything. He will quickly see the force of the argument that, by a slight adjustment of the meter, the charge to visitors may be made to include the cost of the capital outlay incurred and a margin of profit to the hotel. Any suggestion towards modernization is not likely then to be turned down on the score of the expense.

The first-floor servery of the County Restaurant, Worthing. The kitchens, service rooms, and serveries are all equipped with the latest gas-heated catering appliances. Water is heated by gas-fired boilers.



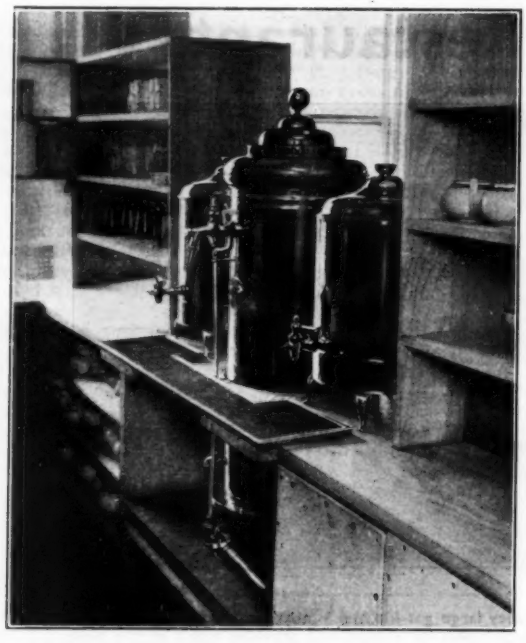
The lounge of Penn Court Hotel, London. The fire is of coke, gas-ignited.

Incidentally, a new method of meter-charging for a hotel gas fire is worth mentioning. In this, panel fire and meter are one; the slot for the coin is in the surround and each coin allows the fire to run for a period of two hours. If the fire is turned off before the expiration of this period, the unused portion remains ready for later use.

There is immense scope, too, for the introduction of gas radiators into hotels and restaurants of all sizes. Here, the practice of Messrs. J. Lyons & Co., Ltd., the famous catering firm, should carry weight. In the restaurants under their control a large number of gas radiators, fitted with thermostatic control, are in use.

For the Public Rooms.

In lounges, writing rooms, and other living rooms many hotel proprietors choose solid fuel fires. There is, however, no reason why these should not be gas-ignited coke fires—like that in the drawing room in the King's House. The saving in labour and the cheerful appearance of the fire should do much to commend this type to hoteliers.



One of the gas-heated counter sets with a 400-pint per hour water boiler and 1½-gallon milk and coffee containers, which forms part of the gas equipment in the Empress Hall at London's new Exhibition Buildings, Earl's Court. The kitchen can provide 1,000 meals a day.

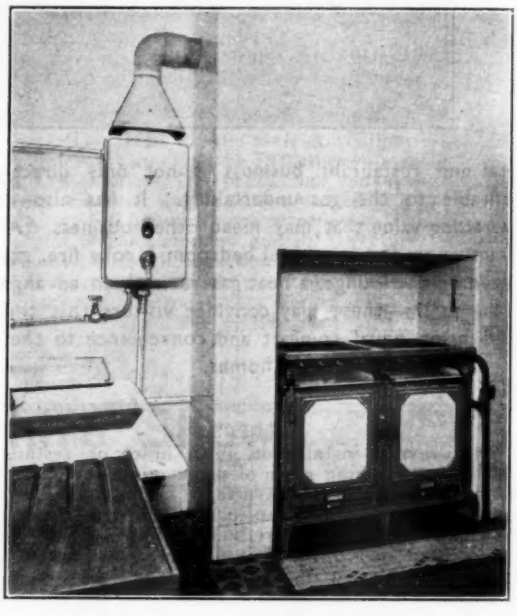
In the larger establishment central heating by gas is a possible proposition. Some undertakings are pushing central heating with great success. The Leeds Gas Department, for instance, was responsible for over twenty new installations of one sort or another last year, while at Middlesbrough and Leicester the Gas Departments are also being very successful in this direction. Against the cheaper price of coke for central heating in hotels, the gas salesman has as his chief arguments the saving in labour and the automatic working of gas-fired plant. The latter advantage in our variable climate is a strong point in its favour.

Small and medium-sized hotels, boarding houses, and restaurants offer excellent prospects for gas water heaters. The larger establishment may depend on solid fuel for this purpose, but will be won over if it can be shown that greater convenience is obtained and that saving in labour offsets the slightly higher fuel cost.

The Hotel Kitchen.

The Gas Industry has a magnificent story to tell when it comes to the equipment of the hotel and restaurant kitchen. From famous luxury hotels such as the Savoy, the Berkeley, and the Trocadero down to new establishments such as the Caveman, Cheddar Gorge, Prunier's, and the East Beach Café, Bournemouth; from the largest kitchen, such as that which caters at one sitting for 8,000 employees of Messrs. Montague Burton, Ltd., down to the smallest tea-shop, gas is the most popular fuel, and where gas is not the sole fuel a combination of gas and steam is generally found. Mr. Stanley J. Benham, the Managing Director of the well-known firm of kitchen equipment manufacturers, has stated that in his opinion "gas at the rates charged by the Gas Light and Coke Company is definitely cheaper for cooking than electricity at ½d. per unit, even for roasting, grilling, and hot closets, but for broiling table and boiling water the difference is quite 50% in favour of gas." (Mr. Benham's firm, it should be noted, deals with equipment using any of the recognized fuels.)

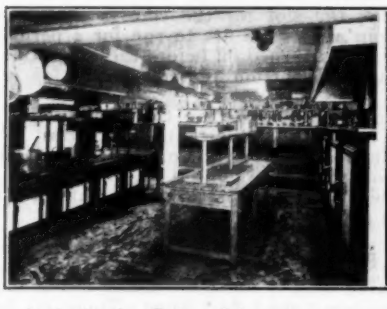
This testimonial, coming from an independent source, is extremely valuable when electrical interests are trying to gain a footing in the large-scale kitchen for roasting and grilling operations and for hot closet work. And here a recent article on cooking apparatus in an electrical trade paper may be quoted. "Although," says the writer, "owing to the majority of (electrical) commercial cooking appliances being non-standard and usually made up to specification, the retention of large stocks of standardized apparatus by the manufacturers would be impossible, the delay in obtaining deliveries is often very irritating, especially if spare parts and renewals are urgently required. Gas, coal, or coke heated apparatus is usually obtainable at very short notice, compared with deliveries of electrical appliances."



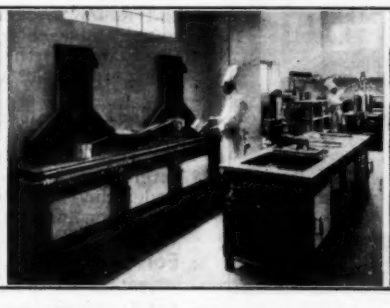
A small hotel kitchen—that in the Oakwood Private Hotel, Blackpool. Hot water for domestic use is supplied by the multi-point gas water heater. Over 40 people can be catered for in this establishment.

No Comparison with Other Fuels.

In cheapness, in efficiency, and, as this quotation shows, in convenience gas large-scale cooking equipment need not fear comparison with that consuming other fuels; but the gas salesman, nevertheless, should see that the claims of



At the London Casino, Soho, guests may dine, dance, and enjoy a cabaret show in continental fashion while being served with a meal from the all-gas kitchen.

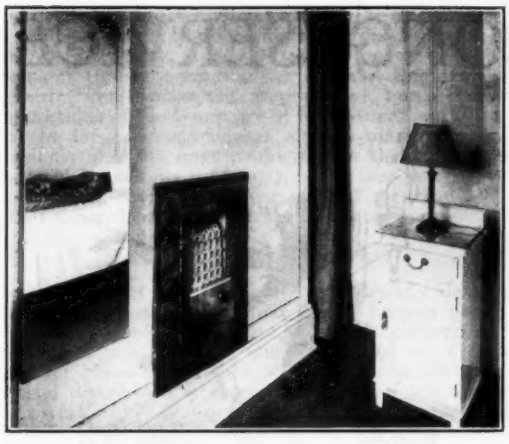


The Gibbons Hotel Torquay, has recently been reconstructed, and the kitchens have been entirely gas equipped. In the background is the servery, with a gas-heated counter set for water, coffee, and milk.

A view of one of the main kitchens of the Savoy Hotel, London, which has recently installed some gas-heated catering equipment.

gas are kept well to the fore in the minds of all hotel managers in his area. He will be aided in this object if his undertaking arranges an occasional exhibition of hotel equipment in the showrooms, sending out invitations to likely prospects, or, as is done by the Torquay and Paignton Gas Company, incorporates a permanent model hotel kitchen among the showroom displays.

Useful, too, is recent B.C.G.A. literature dealing with hotel, restaurant, and canteen equipment. Issues of "A Thousand and One Uses for Gas" dealing respectively with "Cafés and Tea-rooms" and with "Large-Scale Catering" have been supplemented by an excellently produced illustrated booklet, "Gas Equipment in Private Hotels." These are effective pieces of "prestige propaganda" which should do much to impress on hoteliers and restaurant proprietors the claims of gas.



Panel gas fire in a Folkestone hotel bedroom.

"Newbridge" Gas Pistol

Modifications and Improvements

Some time ago in the "JOURNAL" we described in some detail the Horstmann Gear Company's "Newbridge" Gas Pistol. Improvements, however, have now been incorporated in the latest model which is here illustrated.

While the original "Newbridge" pistol was acknowledged to be a highly satisfactory cooker lighter, some criticism was directed against its somewhat bulky appearance. A noticeable feature is the altered shape and size which has been designed to meet the criticisms raised against the original model. The new pistol is neat, unobtrusive, and very readily handled. This has been achieved by using a standard 1½ volt battery. The battery housing is screwed into the body of the pistol rendering battery renewal a simple and easy operation. An improved and strengthened igniter is fitted which functions satisfactorily under a wide variation of pressures. The filament is kept clear of the main gas flow under all conditions, this feature providing the utmost efficiency. A holster fitting carries the pistol when not in use.

The method of operation is as follows: The action of withdrawing the pistol from the holster automatically opens

the small gas valve in the fitment attached to the cooker and pressure on the button of the pistol opens the second gas valve. By depressing the button to its full extent the battery circuit is closed and the gas ignited. By relinquishing pressure on the button the gas supply is closed and replacing the pistol in the holster closes the gas valve in the fitment attached to the cooker.

The pistol, holster, and fittings are chromium-plated and form a most attractive and useful accessory for all types of gas cooker. The pistol is supplied complete with a suitable length of specially prepared braided rubber tube and standard connection for fitting to the tap rail of gas cookers. Two gas cocks are incorporated—one in the fitment attached to the tap rail and one in the pistol. A double safety feature is thus provided. The new igniter head according to rigorous tests made in the Newbridge Works, Bath, should last almost indefinitely. The battery will give ignition at least five thousand times under normal conditions for a replacement cost of 3½d. Similar operations with matches would cost approximately 8s. 4d.

Analysis of Coal and Coke

British Standard Specification

As part of the work that is being carried out in regard to the preparation of British Standards for the Sampling and Analysis of Coal and Coke, the British Standards Institution have just been issued British Standard Methods for the Ultimate Analysis of Coal and Coke and for the Analysis of Coal Ash and Coke Ash.

Coal ash, as prepared in the laboratory by the incineration of powdered coal in an oxidizing atmosphere at a temperature of about 800° C., consists mainly of oxides of silicon, aluminium, calcium, magnesium, and iron, with smaller amounts of the alkalis, and usually some sulphates.

In addition to the major constituents, coal ash contains smaller and variable amounts of other constituents which may have an important bearing upon the properties and uses of the coal. Methods for the exact determination of such constituents are still under investigation, and it is therefore undesirable that they should be included at the present stage.

The Methods for the Analysis of Coal Ash and Coke Ash, B.S.S. No. 686-1936, have been largely based on the methods recommended by the Department of Scientific and Industrial Research in Fuel, Research Paper No. 28, Methods for the Quantitative Analysis of Coal Ash, by Dr. J. G. King and Mr. H. E. Crossley.

Methods are included for the determination of silica, iron, titanium, aluminium, calcium, magnesium, manganese, sulphur trioxide, alkalis, and phosphorus. It has been recognized that in many instances the full analysis would be too long for certain commercial purposes, and two shortened forms of analysis have been included in Appendices. The first short course of analysis, which has been termed "The Rational Method of Analysis of Coal Ash" has been largely based on the work carried out by Dr. Lessing. It aims at a rapid determination of the main characteristics of an ash, and is based on the subdivision of the ash into three fractions, (1) soluble in water, (2) insoluble in water but soluble in hydrochloric acid, (3) insoluble in hydrochloric acid.

A shortened method of ash analysis is also included which cuts down considerably the time taken by the standard method. The shortened method provides for the determination of silica, alumina (together with titania and combined phosphoric oxide), ferric oxide, calcium oxide, alkalis, sulphur trioxide, the balance of the ash being assumed to be magnesium oxide, mangano-manganic oxide, &c.

The Standard Methods for the Ultimate Analysis of Coal and Coke, B.S.S. No. 687-1936, include determinations of carbon and hydrogen, nitrogen, sulphur, phosphorus, arsenic, and chlorine, while methods are included in Appendices for the determinations of carbon dioxide and of "sulphate" and "pyritic" sulphur in coal. It is of interest to note that it is recommended that the analysis should be reported on the "as received," "air-dried," and "dry" coal basis.

Copies of these Specifications may be obtained from the British Standards Institution, Publications Department, 28, Victoria Street, S.W. 1, price 2s. 2d. each, post free.

LONG SERVICE TO THE GAS INDUSTRY

A number of firms of long standing on the contracting and manufacturing side of the Industry have collaborated with the "JOURNAL" in the production of a series of articles, under the above title.

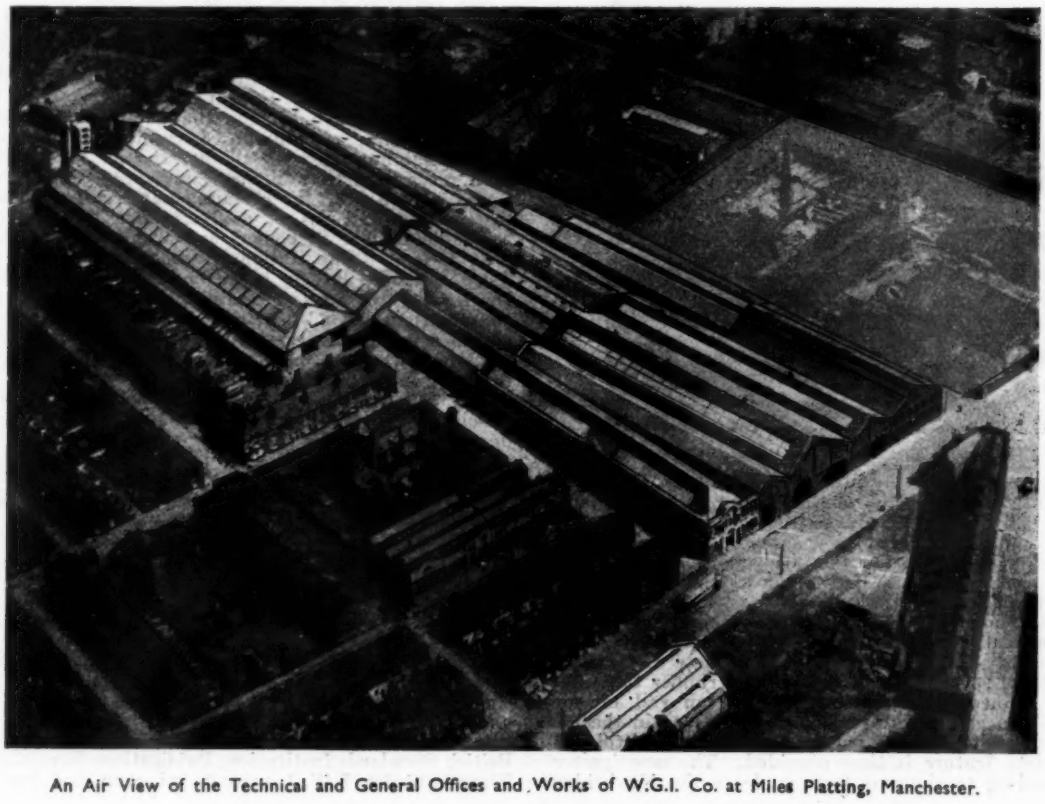
West's Gas Improvement Company, Ltd.

West's Gas Improvement Company was incorporated on April 29, 1874. The first meeting to discuss the formation was held at the Star Hotel, Maidstone, on March 4, 1874, and was attended by Mr. John West and five other gentlemen, the latter constituting mainly the Directorate of the Maidstone Gas Company.

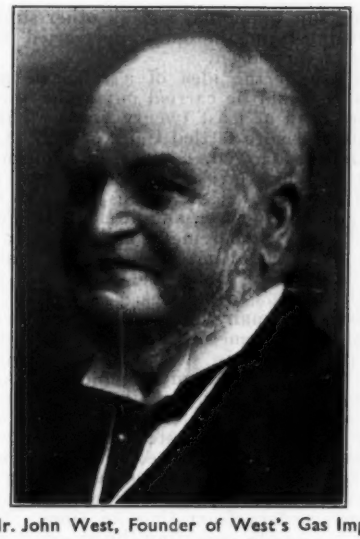
No history would be complete without an early reference to the Founder, and incidentally the mainstay and prime mover of the Company, the late Mr. John West. He was articled in 1855 as a pupil to the late Mr. John Eunson, Engineer to the Northampton Gas Company, a fact which is referred to in the minutes of a meeting of the Committee of Management, held at the gas-works on May 17, 1855. From Northampton Mr. West took up a position at the Hastings Gas-Works, and in 1869 undertook the position of Engineer to the Maidstone Gas Company. Somewhere about 1873 Mr. West turned his attention to designing and developing machinery for charging and drawing gas retorts, mainly to relieve the arduous labour of the stoker; the other principal ends in view being the cheapening of the cost of carbonizing by the reduction of labour in the retort house and improving carbonization results. These early efforts were admirably summarized in an editorial article in the "GAS JOURNAL" of Jan. 18, 1922:

> "Away down in those then little gas-works at Maidstone we to-day picture him as a young engineer—some fifty years ago—designing a hand-worked machine to relieve retort house operation of part of its laborious nature. He was a humanitarian. He pitied the men who had to work in the heat and dust of the retort house, and he set his faculties in motion to bring about emancipation of those men from the most arduous of the conditions of retort charging. He succeeded. The economy that was to grow from this inceptive work was to come later. It was only the beginning to a great end."

Passing on to the development of the Company, the Minute Book (still in existence) proves many interesting details. For quite a number of years the Minutes were written by Mr. West himself, and in excellent handwriting too. It is recorded that on March 4, 1874, Mr. John West,



An Air View of the Technical and General Offices and Works of W.G.I. Co. at Miles Platting, Manchester.



The late Mr. John West, Founder of West's Gas Improvement Co., Ltd., and a great Pioneer.

as Managing Director, was authorized to take on a ten years' lease a factory and house situated at Waterside, Maidstone. These works were on the opposite bank of the river to the gas-works; an office was loaned by the Gas Company to West's Gas Improvement Company, Ltd., and communication between the works and drawing office was generally made by crossing the river in a small barge boat which was sculled with one oar at the stern of the boat.

The Maidstone Works, at which the staff and workmen probably never numbered more than 45, was responsible for the developments in stoking machinery until the early part of 1884.

The first actual contract carried out for stoking machinery was really an installation at the Maidstone Gas-Works, made initially as an experiment; but after a period of successful working the plant was taken over by the Gas Company. This fact is recorded in the Minute Book on Nov. 9, 1876. The Maidstone Gas-Works in those early days was the " Mecca " of the Gas Industry, and was visited by many Engineers from Gas Undertakings in this country and abroad, anxious to investigate these developments in labour-saving machinery.

The results at Maidstone attracted an investigation by the authorities in Manchester, and the Gas Committee paid a visit to Maidstone. During their visit, however, they appeared to have been not only very favourably impressed by the stoking machinery, but also with its inventor. The position of Chief Engineer to the Gas Department of the Manchester Corporation being vacant at the time, Mr. West was invited to apply for the position, which he secured and took up in 1880. This led to his severance from the Maidstone Gas Company, and for several years he not only carried out the important duties of Chief Engineer to the Manchester Corporation Gas Department, but also directed the operations of the Company at Maidstone.

For the larger retort houses manual machinery had its limitations, and the next problem was the application of power to the machines. About 1880 the first power machine was designed, actuated by compressed air; and the first contract secured for the Manchester Corporation.

The Albion Ironworks.

The business of the Company was steadily developing, and the lease of the Maidstone Works having nearly expired, it was decided to remove the whole concern to Manchester to a much larger works, and to an area more central for closer association with the manufacturing and industrial districts, and, further, to obtain the advantage of Mr. West's closer co-operation and supervision. In the early part of 1884, therefore, the removal took place, and a considerable quantity of tools and machines were removed to Manchester, together with the staff and a number of the workmen. Altogether the number of staff and workmen transferred from Maidstone to Manchester was about 20.

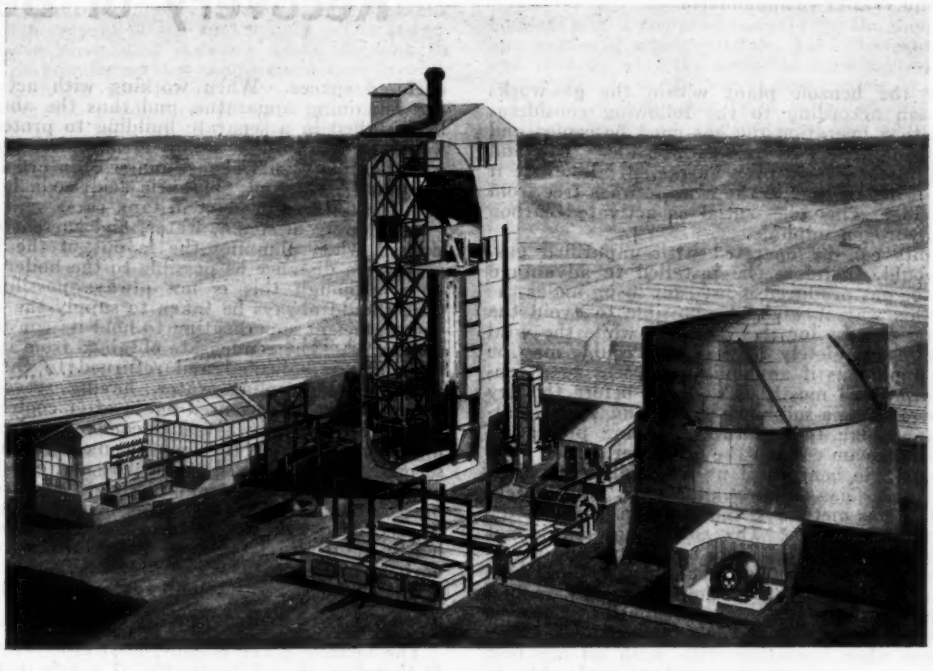
The Manchester Works, the taking of which must have been considered by some a great adventure, covered approximately 7,500 sq.yd., and of this portion 3,400 represented covered workshops.

During the early years in Manchester the whole of the machine shop and erecting shop comprised what is now known as the " Old Machine Shop." In this shop the whole of the machining operations was carried out, together with the erecting and testing of stoking machinery, coal breakers, &c. The smithy was practically as it exists to-day, the platers' shop was a small department in a building at the end of the present new machine shop, and the foundry was situated where stands what is known to-day as the mouthpiece shop.

In 1884 the covered workshops and offices occupied approximately 3,400 sq.yd.; the remaining portions represented 3,100 sq.yd., mainly comprised in two uncovered yards. The land included that covered to-day by the new machine shop and what was then termed the foundry.

No serious development in this respect took place until the early 'nineties, the first main extension in 1891 taking the form of a new erecting shop adjacent to the machine and fitting shop; this, to-day, is known as the new machine shop. The extension was followed in 1893 by the first of a large series of extensions of the platers' department, and consisted of the covering in of the yard adjacent to the foundry.

The question of additional land for extensions now became an urgent matter, and in 1897 the land at the far and East end of the Works, comprising 9,677 sq.yd., was taken over. In 1903 the premises previously rented on lease were



A drawing showing the layout of the Research Gas Plant at Albion Ironworks.

acquired by the Company along with additional land. The premises purchased also included those adjacent, occupied as a shoeing forge and wheelwright's shop, and these were ultimately covered in 1914 by fitting and erecting shops. Still more room, however, was required for the platers' and structural steel departments, and further land was taken over on the North side of Grant Street.

With this additional land "C" and "D" bays were possible, and were completed in 1914. Concurrently with the extension to the platers' shops, extensions were proceeding to the machine and fitting shops. Commencing in 1914 and completed in 1915, on this site were erected new fitting and erecting shops, turning the erecting shop added in 1891 into a machine shop.

In 1884 the covered area was approximately 3,400 sq.yd.; to-day the covered area is approximately 22,200 sq.yd.

In considering the manufacturing plant at the disposal of West's Gas Improvement Company, it is necessary to bear in mind the purpose for which it has been installed and developed. The Company's business is that of the construction of carbonizing plant for the manufacture of town gas, together with all the coal and coke handling machinery in connection with it. And in addition to this main product, and indeed anterior to it in the history of the Company, there is an extensive business in all forms of machinery, bunkers, and general structural work in connection with the mechanical handling of coal, coke, ashes, and other materials.

The Company's business can be divided, in the first place, into two main sections, (1) general machinery, and (2) structural steelwork. Both these sections are dealt with at the Albion Ironworks, and the works is laid out in two corresponding sections, each under its own superintendent, and each with its own system of receiving raw materials and dispatching finished products.

The Research Plant.

The research plant and laboratories are situated at the extreme easterly end of the site. Here is built a full-scale carbonizing plant, with the complete ancillary plant, including wet and dry purifying plant, exhauster, meters, and gasholder, all designed to obtain the fullest possible data on coal carbonized under actual manufacturing conditions, and a laboratory for the complete analysis of coal, coke, tar, ammonia, and all other substances used in, and resulting from, the many and varied investigations which are here carried on.

The inception of the idea of a full-scale gas-works in which research could be carried out under the firm's own control dates back at least twenty years. The realization had to await the more settled times of 1922-23. When the time for building arrived, much research work had been carried out in Glover-West vertical retorts, notably the preliminary researches at St. Helens, those at Macclesfield, Southport, and Uddingston, and later at the Fuel Research Station itself, but much remained to be done, and that of a character which could not be effectively achieved except in a plant absolutely under the immediate and prompt control of the makers themselves.

In the laboratory many hundreds of samples of coal have been fully analyzed, generally with calorific determination, ash fusion points, and in some cases a complete analysis of the ash. In addition, many samples of coke, tars, ammoniacal liquors, refractories, boiler feed water and boiler scales, oils and greases, heat-resisting metals and metallic alloys, have been analyzed, tested, and investigated.

The laboratory is fully equipped with all the most modern apparatus for routine work, and a growing amount of specially devised apparatus for dealing with such problems as present themselves from time to time. The research department as a whole, including the gas-works, the laboratory, offices, coal store, and coke-testing yard, covers an area of approximately 140 ft. by 60 ft., and is situated, within the boundaries of Albion Ironworks, on a compact site.

The research department serves as a preliminary training ground for the pupils of the Company. These young men come for training in general engineering and design, and particularly in the erection and operation of gas-works plant. In the latter respect they are enabled, in the research department, to get a thoroughly good insight into the operation of a complete gas-works which, while being of full practical scale and size, is so compactly arranged that the whole of the processes and operations can be readily seen and grasped at one and the same time. There must be many young men now occupying useful positions in the Gas Industry whose first gas-works experience was acquired in "West's Research Plant."

The Designing of Gas-Works With Reference to the Recovery of Benzole

By F. PLENZ

From a contribution to the Chemical Engineering Congress of the World Power Conference by F. Plenz, of the Deutscher Verein von Gas- und Wasser-Fachmännern.

The site for the benzole plant within the gas-works should be chosen according to the following considerations: For faultless operation the gas must be cooled and freed from all impurities as far as possible. Tar and ammonia must already have been extracted. Likewise it is advisable to bring the gas to the benzole wash free from hydrogen sulphide. This is essential as activated carbon is sensitive to hydrogen sulphide.

Wash-oil plants can be operated with unpurified gas. Such plants would, therefore, be installed to advantage where part of the gas produced is used for firing under the furnaces. In this way it would be possible to avoid the sulphur cleaning process for this quantity while the vital benzole content is completely recovered. Trouble may be caused in the apparatus if ammonia is present to a considerable extent, which mostly is the case before the dry cleaning. The ammonia-sulphuric compound formed attacks the iron at high temperatures, causing premature destruction of the steam coils in the oil heater.

For this reason the benzole plant is usually erected at the end of the whole gas-cleaning apparatus, immediately before the station gas meters, as the gas then possesses the necessary degree of purity. The space required is not considerable compared to most other installations in a gas-works. As a rule an area of about 1,000 m^2 (1,196 sq.yd.) is required to install the whole apparatus, including washer and storage tank, having a capacity of 150,000 to 200,000 m^3 (5,295,000 to 7,060,000 cu.ft.) per day. Vertical washers when operating with wash oil are best placed in the open, and rotating washers preferably in enclosed spaces. When working with activated carbon, the remaining apparatus, and thus the absorbers, should be installed in a separate building to protect it from the weather. A railway siding is absolutely necessary even with benzole plants of medium size, in order to be able to supply the wash oil, sulphuric acid, soda lye, &c., and to ship the finished product in tank cars.

The supply of steam, water, and current should be considered when planning the layout of the benzole plant; as short a distance as possible to the boiler room is desirable, although this is not always possible in practice. Care should always be taken to supply the steam dry and with sufficient superheating to hold its consumption within due limits. The condensate obtained from indirect heating by steam is collected and returned to the boiler house. Likewise the cooling water, having served for indirect cooling only, can be used again after cooling in the stack cooler in the usual way. The condensate from direct heating, obtained in the separating cylinders after the secondary cooler, distillate cooler, and eventually the side column, is usually not employed again; it must, however, pass through a sufficiently large benzole separator in order to recover any oil or benzine which is present before being led to the drains. The same procedure is applied in active carbon plants with which, however, the proportion of direct steam is greater than that of indirect steam.

Prevention of Fire.

The benzole plant is considered especially liable to fire. It therefore should be erected at a safe distance from the

other buildings and storage tanks. The arrangements for fire prevention and fighting should be carefully planned. The use of a naked flame or light, which is always forbidden in gas-works and similar plants producing or storing gas, should also be forbidden in the benzole plant. The Association for Fire Prevention in the Rhine-Westphalia Mines has made some valuable suggestions based on extensive experience in the building and operating of benzole plants. Included in these are: Steam connections to be provided so that in case of fire the whole plant may be filled with steam, in order to drive out the air and thus choke the fire. All doors to be provided with sills, and floors made sloping, so that outflowing oil can be collected and after passing a gravel filter conducted to a special pit. Generally, the installations are the same as those required for fighting oil fires in transformers and oil switches in power plants.

For the planning, erection, and operation of a benzole plant certain guarantees as to yield must be given. The following items should be stated:

Quantity and quality of the benzole,
Amount of benzole remaining in the gas,
Consumption of steam, cooling water, and power,
Pressure loss within the plant,
Consumption of absorption medium.

The regulations laid down in the *Hints for Guarantees and Proof of These in Benzole Plants* should be observed, as laid down in 1934 by the German Association of Gas and Water Experts in a booklet which also contains detailed recommendations for gauging the capacity of a plant.

Influence on the Operation of the Gas-Works.

When a benzole plant is added to a gas-works a considerable change in operation is to be expected. The benzole wash causes a decrease of the calorific value—*i.e.*, for 1 gr. benzole each about 10 kg. calories, so that a wash of 20 gr. per m^3 would cause a decrease of 200 kg. calories. The ratio of coal gas to water gas therefore must be changed, in order to recoup this loss. For the above example of a benzole wash of 20 gr. per m^3 the figures would be, as referred to 1,000 m^3, as follows:

—	Without Benzole Production.	With Benzole Production.
Coal gas	618 m^3	691 m^3
Water gas	382 ,,	309 ,,
Coal supply	1·79 m.t.	2·02 m.t.

The coal required is increased by 13%; accordingly the retorts with their auxiliary plants are also charged with the same excess. The coke supply obtained is raised in the same proportion and the coke-screening plant must give additional service. It is therefore important in planning the layout to provide sufficient reserve for the operation of the benzole plant. The benzole wash, however, does not influence the size of the apparatus, as, measured by volume, the amount of benzole steam is reduced.

The water gas plant is influenced even to a larger extent than the ovens in respect of the coal supply. The reduction in the above mentioned instance would amount to about 19%, so that under certain conditions a considerable part of the water gas plant may have to remain idle. This reduction in the production of water gas allows a quantity of coke to be sold, which together with the additional production might increase the salable coke by about 18%. The installation of the benzole plant affects operation, taken as a whole, in that retort production is raised, water gas production is lowered, and the yield of by-products, especially salable coke, is augmented. The gas-works can therefore regulate the maximum and minimum production to a considerable degree—*i.e.*, the operation of the retorts can be adjusted.

These adjustments can be made to suit the gas plant, for they do not exert any influence upon the gas consumption, neither does it matter if the gas contains benzole or is partly or wholly free from it; the important thing is that the desired calorific value is obtained by the appropriate mixture of coal gas and water gas. Moreover, it will depend upon economic considerations if it is deemed advisable to shut down the benzole plant, especially for an extended period of time, so as to regulate production. Actual conditions in the fuel market would render the complete extraction of benzole from the gas with modern apparatus profitable under all conditions.

Effect on the Quality of the Gas.

Any differences in the quality of the gas due to the extraction of benzole are due mainly to the changed relation between coal gas and water gas. The hydrogen content remains unchanged, while the methane content is raised. The carbon monoxide coming mainly from the water gas is reduced, which is very desirable. The content of heavy hydrocarbons is naturally smaller owing to benzole recovery. The specific gravity is lowered in a small measure, but the calorific value remains the same. The other qualities determining the gas consumption, such as speed of lighting, volume of flame, flame temperature, &c., are not affected to any considerable degree, so that all in all no difference is to be noticed in the gas, whether it contains benzole or not.

The naphthalene content of the gas is naturally reduced considerably by a well-conducted benzole wash, which means that the washing is done at as low a temperature as possible, that the wash-oil is free from naphthalene at the start, and that in the course of operation the collected naphthalene is regularly extracted. Activated carbon acts even more favourably in this respect, as it removes the naphthalene almost completely from the gas.

Influence on Pipe Lines.

The question whether a gas, free from benzole, favours oxidization of the pipe lines and thus may cause their premature destruction, is still under dispute. Some seem to believe that the benzole hydrocarbons of the gas form an oily lining on the inside of the pipes, which serves to retard, if not to prevent entirely, any attack of rust. This theory, however, is improbable, for usually the amount of hydrocarbons is not sufficient to reach the dew point in the gas, even at a low temperature, which could cause them to separate. At any rate, a restricted benzole wash, as practised in some gas-works, cannot change anything, because the fractions with a higher boiling point, which are more apt to condense in the pipes, are removed first in the benzole wash, while the highly volatile parts remain in the gas. It would be highly desirable to have this question cleared up finally. The benzole wash has certain definite advantages, principally on the economic side, which by far outweigh any disadvantages. The gas-works can dispose of the benzole as a by-product, which tends largely to reduce the cost of gas production. It is supposed, however, that a first-class benzole is being produced, which can be used as a fuel for motor engines and can be sold as such without causing any complaints.

Comparative Advantages of the Two Processes.

The two processes with wash-oil and activated carbon offer a number of separate and distinct advantages, which might decide their application in the gas-works.

The wash-oil process may be employed alone, also in sulphur-containing gas. It should therefore be preferred where part of the gas is being used for firing, for which purpose the gas is generally used before the sulphur is removed. Gas-works aiming at a large production of coke will prefer the wash-oil installation to the sulphur-cleaning system. In such cases the water gas is possibly only added after the benzole plant; the size of the benzole washers can be more reduced than when the mixed gas is washed. Benzole recovery by activated carbon can claim that an especially thorough cleansing of the gas is effected simultaneously with recovery of the benzole. Thus the naphthalene content is removed completely, the amount of cyanide and oxides of nitrogen in the gas is lessened considerably, and thereby also the cause of resinification, which often causes trouble at the valves and gauges.

The adsorptive capacity of activated carbon for benzole is little affected by temperature; this process may therefore also be applied to advantage where, owing to bad conditions of cooling water, the temperatures of the gas are higher than usual. Finally, the activated carbon process makes it possible to separate low-boiling constituents from the gas; opinions about the efficiency of the latter in a motor engine are very much divided, however.

Raising the Yield of Benzole.

The amount of benzole in the gas depends upon the quality of the coal and the process used. A pure coal gas contains 30 gr. per m^3 and more; while the mixed gas usually contains about 20 gr. Many attempts have been made to raise the yield of benzole, such as exhausting the inside and crown of horizontal chambers. When the crown is exhausted by means of a channel arranged above the chamber, the yield of benzole is increased by about 10%, probably owing to a subsequent thermal treatment of the gas and tar vapour. Inside exhaustion is done in an entirely different way: Part of the gases, which contain a considerable quantity of liquid hydrocarbons, is exhausted by pipes placed in the coal cake, so that the whole extraction may be raised by 30 to 40%. Since inside exhaustion is done at a relatively low temperature, the hydrocarbons received have a benzine-like character. By this process the total amount of motor fuel recovered may be raised, but, on the other hand, not the extraction of benzoles.

Irish Association of Gas Managers

Presidential Address

OF

P. J. MacEVOY

(Managing Director of the Midleton Gas Company, Co. Cork.)

Presented at the Annual Meeting of the Association held at Jury's Hotel, Dublin, on Aug. 11, 1936.

The President.

My year of office has been a happy one. Though we have had difficulties of one kind or another, the co-operation of our members at home and in Great Britain easily surmounted them. This co-operation was strikingly shown by the generous response to my appeal on behalf of the widow and orphans of the late Mr. Drohan, who gallantly lost his life on Christmas Eve last in saving that of one of his workmen. To our friends all over the world a special word of thanks is due for their fine response to this deserving cause, and particularly to Mr. Alexander, who sponsored the appeal.

It was with the greatest regret that we heard of the resignation of Mr. Airth, who has been Secretary of this Association for over 27 years. Kindly and helpful always and with an outlook on the things which matter most in life, he was a shining example to us all. I wish to assure him of the deep appreciation and affection in which he has been held by us, and to wish Mrs. Airth and himself every happiness in the years to come.

A Year of Progress.

The past year has been one of splendid progress for our Industry in Ireland, in spite of severe handicaps of coal duty and other intolerable levies brought about by a stupid so-called economic war. The amount of gas sold exceeded the previous year's by no less than 500 million cu.ft., and the number of consumers by 15,000.

If the Gas Industry is a barometer of conditions now existing, there is no doubt that " things in Ireland " are on the mend from a business standpoint.

The figures which I have quoted are a striking tribute to a public service which plays no small part in the economy of the nation, and which in the domestic sphere has no equal. Gas has been adopted in preference to its competitors on merit and service alone. It is up to us as representatives of this basic Industry to uphold the tradition of service by honest endeavour in making our products still more worthy of public confidence and support. We can stand behind this never-failing source of light, heat, and power and back it with enthusiastic service.

The fundamental problem in this country at the moment is the finding of employment for its nationals, and the future and happiness of our people depend on the solving of this great issue. Our Industry is one of the greatest assets in this respect. The relation between employer and employee is second to none. The total capital is £5,600,000; the number employed 4,500; wages bill yearly £600,000; contribution to local and general taxation £140,000.

The figures for the Free State are:

Capital.	Employees.	Salaries and Wages.	Taxation.
£3,000,000	2,400	£340,000	£95,000

These figures are exclusive of casual labour employed in coal-handling, &c. This shows the value of the Gas Industry from a national and economic aspect; and surely it is entitled to the same sympathetic support as its chief competitor, which is backed by Governments, North and South, and which in most cases is free from taxation.

We do not ask for doles or subsidies, but simply to be allowed to carry out our work, free from Governmental interference and exasperating difficulties. Our Association is symbolic of what can be done by united efforts and good will in bridging troubles and settling problems that may arise. Let us hope that all these worries may be adjusted soon, and a commonsense view taken of things that really matter in the economy and happiness of our country.

The recent " Conditions of Employment Act " is going to place a very serious financial burden on the Gas Industry in the Free State, and in some cases it will mean the turning of a modest profit into a loss. It seems that the sponsors of this measure have displayed what might be called a " puckish " delight in incorporating clauses which are vexatious, unnecessary, and nearly impossible to comply with. Take, for instance, Sunday work regulations—which are framed in such a way that the whole system of this essential duty must be changed. Hitherto the Industry had collaborated with the workers and trade unions to their mutual satisfaction. All recognized that a policy of give and take was necessary in dealing with this phase of gas-works practice—so important to its continuous process and economic working. The economic law is inexorable, as proved in the history of our times. Gilbertian governmental measures framed on political expediency by people who have little experience of things that matter most in carrying on sound business undertakings will stifle industrial activity and place a brake on enterprise. This great Irish Industry is deserving of a little more sympathetic consideration by the framers of this Bill, and an amendment of this particular penal clause is being asked for.

I believe we are only on the fringe of development technically and otherwise. Perhaps at no distant date our raw material will come from home sources—peat and turf—which, if utilized in gas manufacture, could well revolutionize the industrial outlook of this country. I feel sure that we shall be in the van in using this dormant source of wealth in the production of cheap gaseous fuel. Our Government in the South has shown what can be done with the natural waterpower resources of the country. This national effort was necessary if the industrial policy was to progress on modern lines. We admire and appreciate all this from a power standpoint, but from that of heating and other applications we claim that an abundant, cheap, and flexible native fuel is essential if this policy is to be maintained. Gas fills all requirements needed and is indispensable to practically every industry established. Here, then, is an opportunity for enterprise. We will prove our practical patriotism by assisting in every way possible any effort made to use this source of national wealth.

Peat and Brown Coal.

The Germans have been successful in the use of peat and brown coal for gas manufacture. In Great Britain coal has been used in the production of benzole and other motor fuels for some years past. The Dublin Gas Company have been very successful in the Irish market with a native motor fuel derived from coal, and this by-product has been very valuable.

In the future imported coal may be infinitely dearer owing to its increasing value in the hydrogenation plants established in these countries for the extraction of motor fuel. They are striving after self-sufficiency in these essential fuels. Coal was the greatest factor in forming industrial Britain; and later developments indicate that its by-products will keep her there. It is important for us to find a native fuel supply—else the efforts to build up an industrial economy has little chance of success. Eventually I believe complete gasification will be the rule and the gas stripped of its valuable rich products.

There is a demand for flexibility in fuel, and this old but ever youthful Industry can supply all needs and hold the

field against all competition. Of course, total gasification is the only method of dealing with this fuel of low calorific value, and some form of enrichment can be devised to increase its utility. Our Fuel Research Board can erect an experimental plant to explore its possibilities—or collaborate with our Industry for the same purpose. The versatile talents of our engineers and chemists have been proved time and again, and technical developments will reach new heights of achievement in future carbonization processes. If we study the modern trend of both domestic and industrial life we shall be forced to realize the demand for gaseous fuel. Hence it is necessary for the younger members of our profession to acquire a scientific training to fit them for problems which lie ahead.

The education in our schools and colleges is of the utmost importance, and a co-operative effort should be made nationally to improve the standard of technical training. The future depends on our engineering and chemical staff—backed by profound faith in our products. In manufacture and distribution the saturation point is never reached. Outside food and drink the gas-works is capable of catering for nearly every human need and is the basis for all fundamental chemistry.

I would suggest to the powers that be, educationally and nationally, that they pay a visit to the Dublin, Belfast, or Cork gas-works and learn first-hand what constructive national work is being done in the chemical sections.

Perhaps then they would realize the absolute fact that the Irish Gas Industry is pulling its weight in our national life and has as much right " to wrap the green flag round me, boys," as others who are appealing for support under that banner.

This country is being re-born, and the housing schemes carried out by local authorities and private enterprise have changed the social outlook of its people. A Government can do no better work, and it is a source of pride and gratification to any Irishman to see the wonderful change which has taken place in the last decade. Incidentally it is a great asset to gas undertakings to increase their output by installing gas for every purpose in those new homes. I would make an earnest appeal to our members to be generous with these new consumers so as to make them " gas conscious " and appreciative of the service which it can offer. In Ireland the prepayment customers are the bulwark of the Industry, and the domestic load created by them has been enormous. Their business is on a cash basis and they should receive the privileges, universal in commerce—*i.e.*, goods at a cheaper rate. The working classes have great appreciation of the benefits bestowed on them by the convenience and utility of all gas appliances. A generous response is invariably the rule when this type of consumer feels he is getting cheap, efficient service. These consumers account for 60% of our output—so why should they pay more than others who are not so productive of revenue in the aggregate?

It is obvious that the most successful of our undertakings are those which have endeavoured to make their prices attractive, combined with good service. The public are quick to realize the advantages of an unequalled domestic help at a reasonable figure.

The Future.

It is up to us by vigilance, undaunted courage, and absolute faith in our products, to make gas the fuel of the future in Ireland. We have the very best to offer. Let us go out and sell at as low a price as possible and help our consumers to use gas to the very best advantage. Advertise widely, as there is no form of propaganda more useful than that in the daily and weekly Press. Silence is not golden in the market place; the Irish public must be educated in all uses of gas through the newspaper. This great selling medium will help us in the sales of our products.

In a few years of Press publicity the Gas Industry of Great Britain has increased sales by 50%. The British Commercial Gas Association is an outstanding example of virile publicity methods, and the whole Industry owes this great organization a deep debt of gratitude for its work. At the moment the merits of the gas refrigerator are being brought before the public. This apparatus should be in every modern home,where it would be found almost as useful as the gas cooker in its own sphere. Unfortunately the Government has just put a tariff on refrigerators, but efforts are being made to have this tariff taken off. The water heating load also offers an enormous field for development, and here again is the need for offering gas at the lowest possible figure, so that this ever-ready and reliable system can be made an economical proposition.

We are custodians of the destinies of a great Industry. Let us prove ourselves worthy of the faith which we hold in this superlative " Public Servant No. 1."

Again I wish to thank each and every member for the loyal co-operation which I have received, and to assure them of my deep appreciation of the honour which I have felt as President of this All-Ireland Association.

Gas Undertakings' Results

Ambleside.

At a recent Lakes Urban Council meeting at Ambleside it was reported that there was an increase of 10% in the year's sale of gas over that of the previous year. The increase in the sales for the past three years was 22%. There had been a very large increase in the sales of appliances and fittings, representing an increase of 35% in value over the previous year, which indicates the very great growth of the undertaking. The financial returns showed an equally successful position. The gross profit was £2,098, and after deducting loan charges, income-tax, &c., the net profit was £499. Coke sales have also been satisfactory.

Birmingham.

The report of the Birmingham Gas Committee for the year ended March 31, 1936, was presented at the meeting of the Council on Tuesday, July 7, 1936. The report states that the total amount of capital authorized is £5,758,556, an increase of £147,679 over the figure recorded in the previous year. The actual capital expenditure for the twelve months ended March 31, 1936, was £121,848. The quantity of gas sold during the year was a record in the history of the Undertaking, the total sales being 15,419,834,400 cu.ft., an increase of 975,803,700 cu.ft.—equivalent to 6·76% over the previous year, which was in itself a record. The net amount received from the sale of gas totalled £1,859,857, an increase of £105,456. The amount received from the sale of residual products is £43,400 above the figure appearing at March 31, 1935. This is mainly in consequence of the additional quantity of coke sold and the higher price realized. The total charges against revenue account amount to £2,066,886, an increase of £147,116. The credit balance on revenue account amounts to £340,396. After providing for annuities, interest on capital, and income-tax, together with redemption charges on capital, the sum of £24,147 remains to be transferred to the Appropriation Account. To the balance brought forward from March, 1935, has been added interest from Reserve Fund Investments, together with the appreciation of investments during the year, making the total standing to the credit of the account £153,417, as compared with £148,592 at March, 1935. After crediting the sum of £42,671 brought from the Appropriation Account, a balance of £91,580 is carried forward, as compared with £79,902 in the previous year. The Birmingham Gas Order, 1935, received Parliamentary sanction on Aug. 2, 1935. It will be recalled that the application for the Order *inter alia* included the proposal to purchase the Coleshill Gas Undertaking. The Ministry of Health approved this, and the actual transfer took effect as from Sept. 30, 1935, on which date the Coleshill Gas Company ceased to exist and the consumers in the town commenced taking their supplies of gas from the Birmingham mains. The condition of the vertical retorts comprising No. 1 range at Nechells Works makes it necessary for the range to be entirely rebuilt from the existing floor joists during the summer of 1936. This range was originally put to work in 1923 and the bottom portion of the settings has had a life of thirteen years. The work of rebuilding the range—which is to be completed by the autumn of the present year—has been placed with the Woodall-Duckham Company, and the total cost involved amounts to £26,254.

Bo'ness.

The Bo'ness Gaslight Company report an income for the year amounting to over £10,000, and after making a reduction for expenditure there was left for disposal over £2,000. A dividend of 6% free of tax was declared. Owing to the increase in wages and cost of coal, it was found necessary to raise the price of gas by 2½d. per 1,000 cu.ft. as from the last survey.

Boston.

The report of the Directors and general statement of accounts for the year ended June 30, 1936, of the Boston (Lincs.) Gas Light and Coke Company states that the net profit for the year amounts to £6,731. The balance standing to the credit of the profit and loss account (net revenue), after payment of the interim dividend in February last, amounts to £4,268, out of which sum the Directors recommend the payment of the remainder of the dividend on both classes of shares at the usual rates—namely, 8½% and 7%, and the transfer of £481 to the re-

serve fund. These appropriations amount to £1,529, and leave a balance to be carried forward to next year's account of £2,738. The gas rental for the year amounts to the sum of £32,498, which shows an increase of £1,209 compared with the previous year, while the residuals have realized £9,950, showing an increase on the year of £2,112. The number of cookers on hire and hire-purchase at June 30 was 4,906, being an increase of 184 during the year. There is an increase in the number of ordinary and prepayment meters of 177. The total meters fixed is 2,599 ordinary and 4,658 prepayment—in all, 7,257.

Chelmsford.

The annual reports of the Gas Engineer and Manager (Mr. F. N. Howes) for the year ended March 31, 1936, states that the steady growth of the Undertaking, evident for some years past, has been accelerated during the past year, the increase in gas sales amounting to just over 7½%. There is a net profit of £2,557. During the year 178 ordinary and 190 prepayment consumers have been added to the books, and the consumption per consumer increases steadily, being 25,076 cu.ft. last year, against 24,240 cu.ft. in 1934-5, and 24,047 cu.ft. in the previous year. Residual products gave a return of £12,503 net, or 52·73% of the cost of coal. For public lighting 31 lamps were added during the year, giving a total of 738. The sale of apparatus has broken all records, the total value amounting to £9,583 or over £1 per consumer, which is a high figure. The Borough Accountant's annual report states that the gross profit for the year amounts to £20,569. After making provision for loan repayment, interest, income tax, &c., the net profit is £2,557, as compared with £5,062 for 1934-35. The total expenditure on revenue account is £41,847, compared with £39,961 in 1934-35, and in relation to the quantity of gas sold represents 40·04d. per 1,000 cu.ft. as compared with 41·11d. in 1934-35. It is interesting to note that the working expenses of the Undertaking continue to show a decrease, and during the last six years have fallen by no less than 8·42d. per 1,000 cu.ft. sold. The income from sales of gas is £43,529, and is substantially the same as for 1934-35, despite the reduction in price of 10% which took effect from June, 1935.

Falkirk.

At the budget meeting of Falkirk Town Council last week it was stated that the actual income last year from the sale of gas, coke, &c., was £61,990. Working expenditure was £54,260. Gross surplus to meet sinking fund, interest, tax, &c., was £7,730, but charges totalled £13,750. There was a balance on hand at the beginning of the previous year of £885, and interest of £1,605 was credited on sinking fund investments, the end of the year showing a deficiency of £3,530, towards reduction of which the surplus on the reserve fund of £1,115 was transferred, the net deficiency at the end of the year being £2,415. The make of gas for last year was 452 million cu.ft., the estimate for the current year being 460 million cu.ft. The market for residuals remains poor, especially for sulphate of ammonia. The revenue from this for last year was only 0·716d. per 1,000 cu.ft sold, whereas eleven years ago it was 4·14d. Tar has been in poor demand, due to the greater use of imported bitumen for road work.

Hawick.

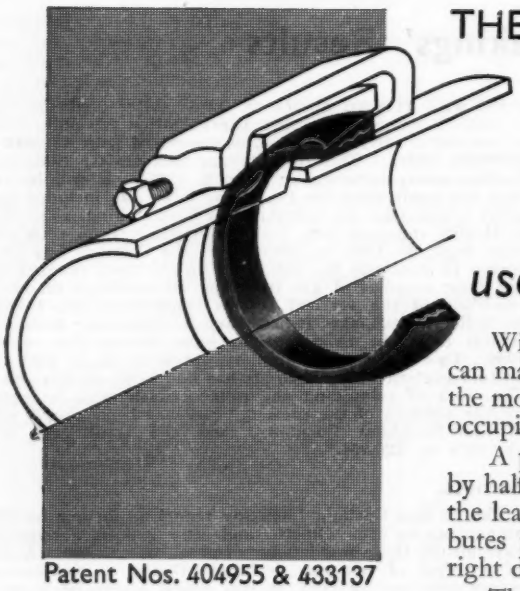
The profit for the year made by the Hawick Gas Company was about £1,000 less than last year, and this was attributable to the reduced price of gas and the slightly higher price of coal. The Directors do not intend to raise the price of gas at present, but if coal prices rise further, they might require to do so. During the past year there had been an increased consumption of gas. The most recent installation in their plant had been gas drying apparatus which gave a much steadier quality of gas with the consequent saving to the consumer. There had been also installed a benzole extractor, which resulted in a bigger production of coke, for which there was a good demand.

Kinross.

The annual report of the Kinross and Milnathort Gas Light Company states that there had been an increase of 995,300 cu.ft. in the quantity of gas sold during the past year, in spite of the fact that during the year Kinross Town Council adopted electricity for street lighting, which meant a loss of approximately 750,000 cu.ft. of gas sold by the Company. Net profit for the year was £1,054, an increase of £177 over the previous year. After adding the balance brought forward and applying £564 to depreciation, there was a disposable balance of £713, from which a dividend of 6%, tax free, was recommended.

Middleton.

The report of the Middleton Gas Department for the year ended March 31, 1936, states that the accounts show a gross profit of £11,314. After meeting loan charges and income-tax and crediting certain amounts in respect of bank interest earned, properties account surplus, &c., there remains a net profit on the year's working of £1,712, against a corresponding figure of £1,617 for the preceding year, an increase of £95. There is a credit balance on the net revenue appropriation account at March 31 of £5,906. The credit balance on renewals account has been increased from £5,296 at the commencement of the year to £5,915 at the end of the year. The total quantity of gas manufactured during the year has been 229,796,000 cu.ft. compared with 227,009,000 cu.ft. last year, an increase of 2,787,000 cu.ft. or 1·21%. The gas unaccounted-for was 11,795,500 cu.ft., as against 12,373,800 cu.ft. last year, the



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The completed Joint holds high air and water pressures, and permits "draw" of the spigot and angular distortion.

Patent Nos. 404955 & 433137

No increase in cost of pipeline

The Stanton Ironworks Company Limited, Near Nottingham

percentage being 5·13 against 5·45 last year, a decrease of 0·32%. The net receipts for residuals and by-products amount to £6,312, equal to a return of 10s. 11·72d. per ton of coal carbonized, as against 10s. 2·99d. per ton, an increase of 4·32d. per ton. The sale of coke realized £4,343, as against £4,010 last year, an increase of £332. During the year 2,469 yd. of new mains were laid. The total value of appliances sold through the showroom on cash, credit, or hire-purchase terms was £5,097, as compared with £7,135 last year.

Montrose.

The Directors of Montrose Gas Company, Ltd., recommend a final dividend of 5%, less tax, making 10% for the year, in their annual report. For the past year, the quantity of gas manufactured was 93,690,500 cu.ft., being an increase of 8,125,000 cu.ft. on the previous year. After deducting depreciation and writing off £43 against tar distillation plant, the accounts show a profit of £5,579, which, with the sum at credit of profit and loss from last year, makes £6,335. The Directors propose to carry to reserve fund £1,000, the interim dividend required £2,000, and the dividend recommended will require the same sum, leaving £1,335 to be carried forward, subject to Directors' remuneration.

Ramsgate.

The Chairman's report on the working of the Ramsgate Gas Department for the year ended March 31, 1936, states that the expenditure on Capital Account amounted to £2,964. Of this, £944 represents expenditure on new mains and services; £1,493 on new fires, boilers, &c.; and £527 on new meters. The total amount provided in this year's accounts for the redemption of capital is £8,408. The revenue from gas sold amounted to £58,181, while rental of meters, cookers, profit on service laying, &c., amounted to £11,754. The total amount received from residuals amounted to £16,057. On the expenditure side, the total cost of coal and oil amounted to £28,498, being £4,449 more than last year. The total revenue amounts to £104,381 and the total expenditure to £85,046, leaving a gross profit of £19,335. Instalments of principal, interest on loans, income-tax, and interest on monies deposited by consumers amount to £15,953, while stoves on hire have been depreciated by the amount of £2,000, making the total expenditure £17,953. This figure, deducted from the gross profit, leaves £1,383. The amount of £393, being interest on redemption fund investments, added to this £1,383, gives the net profit on the year's working—namely, £1,776, which, added to the balance brought forward, £1,260, totals £3,036. The sale of gas to private consumers shows a small increase amounting to £159, and the receipts from the sale of coke show an increase of £1,349. The receipts from public lighting show a decrease of £599.

Salford.

The report of the Salford Light, Heat, and Power Committee with reference to the Gas Undertaking states that the gross income for the year amounted to £330,641, the gross expenditure for the year amounted to £247,938, showing a gross profit of £82,703. Against the gross profit, the following charges fall to be met: Loan charges (interest and sinking fund) £80,897, renewals £10,713, contributions to general rate fund £12,090, making a net total charge to be met of £103,700. There is, therefore, a net debit balance of £20,997 on the year's trading. This compares with a debit balance of £41,015 for the previous year, indicating a substantial improvement in the results. The quantity of gas sold during the year shows a decrease of 0·4% on the previous year. This is the smallest decrease in output which has been reported since 1930, and there is reason to believe that the serious decline in gas sales, which has been the outstanding feature of recent years, and which has been chiefly responsible for the unfavourable financial returns of those years, has been arrested. Residual products have produced a revenue equal to 54·3% of the cost of coal used, against 48·7% in the previous year. A saving of £17,000 (equal to about 3·8% per unit of gas manufactured) has been effected in revenue expenditure. At the end of the year it was reported substantial progress had been made towards the first section of the works reconstruction scheme. This section involves the reconstruction and extension of the vertical retort plant at Regent Road, with the provision of waste-heat boilers and coke screening and storage plant, the provision of new water cooled condensers, the construction of benzole extraction plant, and the addition of drying and neutralizing apparatus to the existing sulphate of ammonia plant.

Stirling.

The Stirling Gas Light Company made a profit of £10,350 during the past year. There has been a substantial increase in the consumption of gas apart from the gas consumed in Bridge of Allan since the Company had taken over the Municipal Gas-Works there. Part of the increase is attributed to particularly severe winter and to the increased sale of gas-consuming appliances. It has not been necessary to increase the price of gas but dearer coal and the increase in workers' wages is making it increasingly difficult to maintain the price of gas at its present low level. Final dividends of 10s. 9d. per share, less tax, on the original capital, and 12s. 6d. per share, less tax, on the new ordinary capital, have been declared.

West Kilbride.

The West Kilbride Gas Light Company made a profit on the year ended March 31 of £921, and a dividend of 7½%, absorbing £286, has been declared. The sum of £547 was carried forward. The total gas production was 17,617,000 cu.ft.

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(Total Capacity Five Millions B.Th.U. hourly.)

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and ALWAYS RELIABLE

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Gas Markets and Manufactures

Stock Market Report

(For Stock and Share Lists, see later pages)

The uncertainty of the European situation has become once more a disturbing factor in Stock Exchange affairs, and this, coupled with the usual end-Account slackness, brought about a slight falling off in the volume of business last week. In spite of the reduced turnover, however, the prices of gilt-edged stocks continued firm, while increased traffic receipts gave a further stimulus to home rail stocks, many finishing at higher levels than a week ago. In the industrial section the popularity of armament shares dwindled in favour of the usual leaders, for which there was a good demand. The general undertone was firm at the close, and conditions appear bright for the new Account opening this week.

In common with other high-class investment issues, business in Gas stocks and shares was also on a reduced scale, though here again prices were well maintained. In the London Official List a few quotations were marked up, the feature being a rise of 5 points in Plymouth and Stonehouse to 170½, while gains of 2 points were recorded by South Metropolitan and Alliance and Dublin ordinaries. Imperial Continental failed to hold the large appreciation of a week ago, and finally closed 8 points down at 157. At the Provincial Exchanges the only movement occurred in Liverpool ordinary with a rise of 1 point to 136, while in the Supplementary List it will be seen that business in the Eastbourne stocks led to an improvement in the nominal quotations.

During the past twelve months industrial issues, under the stimulus of increased trade reports, have become increasingly popular, and this big demand has in many cases forced up prices to levels which may eventually turn out a little disappointing as regards yields. Investors in gas stocks, on the other hand, will, it is suggested, have little cause for complaint in this direction, for with only one or two exceptions dividends on ordinary stocks have been maintained, or increased, for so many years past that any reduction in the current rates appears remote. Moreover, the increasing number of undertakings now selling gas under tariff principles should materially assist in stimulating the present strong financial position. The yields on ordinary stocks at current prices (which at the time of writing contain a full interim dividend) should appeal to the permanent investor, and the following list of a few leaders illustrates the position:

—	Dividend. 1935.	Present Middle Market Price.	Yield % (Gross).
	%		£ s. d.
Brighton 5%	6¼	157½	4 5 8
Commercial	5	99½	5 0 6
Croydon sliding-scale	7	162½	4 6 1
Gas Light units	£5 12s.	28s.	4 0 0
Liverpool	6	136	4 8 2
Newcastle units	5⅝	27s. 3d.	3 19 0
Portsmouth	8½	172½	4 15 7
Sheffield	6	147	4 1 8
South-Eastern Corporation	6	27s.	4 8 10
South Metropolitan	5⅞	126½	4 10 10
South Suburban	6	133½	4 9 10
Tottenham	6¾	152½	4 8 6
Wandsworth	7	161½	4 6 8

Current Sales of Gas Products

The London Market for Tar Products.

Aug. 10.

There is but little change to report in the prices of tar products.

Pitch, nominal, at 35s. to 36s. per ton f.o.b.

Creosote, about 5¼d. per gallon.

Refined tar, 3⅞d.

Pure toluole, about 2s. 4d.; pure benzole, 1s. 7d. to 1s. 8d.; 95/160 solvent naphtha, about 1s. 7d.; and 90/160 pyridine, about 5s.—all per gallon naked at makers' works.

Tar Products in the Provinces.

Aug. 10.

The average prices of gas-works products during the week were: Gas-works tar, 19s. 3d. to 24s. 3d. Pitch—East Coast, 33s. to 35s. 6d. f.o.b. West Coast—Manchester, Liverpool, Clyde, 33s. to 35s. 6d.* Toluole, naked, North, 1s. 10½d. to 1s. 11d. Coal-tar crude naphtha, in bulk, North, 8d. to 8¼d. Solvent naphtha, naked, North, 1s. 4d. to 1s. 4¼d. Heavy naphtha, North, 1s. 1½d. to 1s. 2½d. Creosote, *ex* works, in bulk, North, liquid and salty, 4¾d. to 5d.; low gravity, 4½d. to 4¾d. Heavy oils, in bulk, North, 5d. to 5¼d. Carbolic acid 60's, 2s. 4d. to 2s. 6d. Naphthalene, £21 to £23. Salts, 95s. to 100s., bags included. Anthracene "A" quality, 3d. to 3½d. per minimum 40%, purely nominal; "B" quality, unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *Aug.* 8.

There is still an active demand for cresylic acid and prices are firm accordingly. Other products are relatively slow, although quotations are well maintained.

Crude gas-works tar.—The actual value is 34s. to 35s. per ton *ex* works in bulk.

Pitch.—There is only a limited demand, and, in the absence of definite business, makers continue to quote 32s. 6d. to 35s. per ton f.o.b. Glasgow for export and 32s. 6d. per ton *ex* works in bulk for home trade.

Refined tar.—A fairly steady throughput is being maintained with quotations unchanged at 3d. to 3¼d. per gallon f.o.r. for export and 3¾d. to 4d. per gallon *ex* works in buyers' packages for home trade.

Creosote oil.—Demand is rather disappointing, but quotations are maintained as follows: Specification oil, 4¾d. to 5d. per gallon; low gravity, 5d. to 5¼d. per gallon; neutral oil, 4¾d. to 5d. per gallon; all *ex* works in bulk.

Cresylic acid.—Business is limited for want of supplies and the following prices can only be taken as approximate: Pale, 97/99%, 2s. 3d. to 2s. 5d. per gallon; dark, 97/99%, 2s. to 2s. 2d. per gallon; pale, 99/100%, 2s. 9d. to 3s. per gallon; all *ex* works in buyers' packages.

Crude naphtha.—Available supplies command round 5½d. to 6d. per gallon *ex* works in bulk, according to quality and district.

Solvent naphtha.—90/160 quality is 1s. 5½d. to 1s. 6½d. per gallon and 90/190 heavy naphtha is 1s. 1d. to 1s. 2d. per gallon.

Motor benzole is available in small quantities at 1s. 3½d. to 1s. 4d. per gallon.

Pyridines are, if anything, a little easier at 4s. 6d. to 5s. per gallon for 90/160 grade, and 5s. to 5s. 6d. per gallon for 90/140 grade.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s. d.		s. d.	
Crude benzole	0 8½	to	0 9	per gallon at works
Motor ,,	1 2	,,	1 2½	,, ,, ,,
90% ,,	1 3	,,	1 3½	,, ,, ,,
Pure ,,	1 7	,,	1 7½	,, ,, ,,

Contracts Advertised To-Day

Benzole Recovery Plant,
Skipton Urban District Council. [p. 396.]

Gasholders, Dismantling, Erection, and Extension.
Halifax Gas Department. [p. 396.]

Retort (Vertical) Installation.
Spenborough Gas Department. [p. 396.]

Trade Notes

Cast-Iron Pipes.

We have received from the Staveley Coal and Iron Company, Ltd., nr. Chesterfield, ther pipe stock list of cast-iron specials, and metal-spun cast-iron pipes, all for August, 1936.

Further Gas Undertakings' Result

Northampton.

The Directors' report for the year ended June 30, 1936, to the proprietors of the Northampton Gaslight Company states that an interim half-year's dividend at the rate of £5% per annum, amounting to £11,591, was paid in February last, and after payment of interest on debentures there remains an available balance of £54,906. The Directors recommend the payment of a dividend for the half-year on the Consolidated Stock at the same rate as before—viz., £5% per annum, the maximum allowed (subject to income-tax). This would absorb the sum of £11,591, leaving a balance of £43,315 to be carried forward to the next year's account. The sale of gas shows an increase of 3·1% over the preceding year, and there has also been a record sale of apparatus and appliances, which is most satisfactory. The trunk main from the Northampton Works to Long Buckby is now nearly completed, and in future the gas for that village will be supplied from Northampton. A contract for the lighting of the whole of the town has been renewed with the Corporation for a further period of ten years, and a number of village lighting contracts have been made and renewed.

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- WESTVERTICAL CARBONIZING CHAMBERS
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- WASTE-HEAT RECOVERY PLANTS
- THE WEST LIP-BUCKET CONVEYOR WITH AUTOMATIC LUBRICATION
- COKE GRADING AND PREPARATION UNITS

Contracts placed with West's Gas Improvement Company, Ltd., during the present year have included carbonizing plant installations for the Gas Undertakings of *Altrincham, *Bilston, *Carlisle, *Dudley, *Worcester, and *Yeadon, in England; *Dumbarton, *Grangemouth, and Kelso, in Scotland; *Ballymena, in Ireland, and *Johannesburg, in South Africa.

* Repeat orders

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MEMBERS OF THE SOCIETY OF BRITISH GAS INDUSTRIES.

STOCK AND SHARE LIST

Official Quotations on the London Stock Exchange

Issue. £	Stock or Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Aug. 7.	Rise or Fall on Week.	Transactions, Lowest and Highest Prices During the Week.
1,767,439	Stk.	Mar. 16	7	7⅛	Alliance & Dublin Ord. ...	163—168	+2	166½—168¼
374,000	,,	June 22	4	4	Do. 4 p.c. Deb. ...	94—99	...	...
557,655	,,	Feb. 17	7	7	Barnet Ord. 7 p.c.	169—174	...	...
300,000	I	Mar. 30	1/4⅛	1/9⅛	Bombay, Ltd.	1⅛—1⅛	...	...
179,305	Stk.	Mar. 2	9⅛	9⅛	Bournemouth sliding scale ...	220—230	...	...
590,407	,,	,,	7	7	Do. 7 p.c. max. ...	170—175	...	...
493,960	,,	,,	6	6	Do. 6 p.c. Pref. ...	148—153	...	...
50,000	,,	June 22	3	3	Do. 3 p.c. Deb. ...	84—89	...	87½
262,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	105—110	...	...
335,000	,,	,,	5	5	Do. 5 p.c. Deb. ...	123—128	...	...
357,900	,,	Feb. 17	7⅛	7⅛	Brighton, &c., 6 p.c. Con. ...	170—175	...	...
649,955	,,	,,	6¾	6¾	Do. 5 p.c. Con. ...	155—160	...	...
205,500	,,	,,	6	6	Do. 6 p.c. 'B' Pref.	144—149	...	147
855,000	,,	Mar. 2	7	8	British Ord.	158—163	...	161½
100,000	,,	June 8	7	7	Do. 7 p.c. Pref.	151—156	...	...
350,000	,,	,,	5⅛	5⅛	Do. 5½ p.c. 'B' Cum. Pref.	108—113	...	...
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...	...
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	110—115	...	...
200,000	,,	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	97—99	...	...
100,000	10	22 May '33	6	4	Cape Town, Ltd.	1—3	...	...
100,000	10	6 Nov. '33	4½	4½	Do. 4½ p.c. Pref. ...	1—3	...	...
150,000	Stk.	June 22	4½	4½	Do. 4½ p.c. Deb. ...	80—85	...	...
626,860	,,	July 20	6	6	Cardiff Con. Ord.	128—133*	...	...
237,860	,,	June 8	5	5	Do. 5 p.c. Red. Deb.	108—113	...	...
98,936	I	Apl. 20	2/-	2/-	Colombo, Ltd., Ord.... ...	1⅜—1⅝	...	...
24,500	I	,,	1/4½	1/4½	Do. 7 p.c. Pref....	20/—22/-	...	...
609,204	I	Mar. 30	-/11·48	-/11·48	Colonial Gas Assn. Ltd. Ord.	18/—20/-	...	...
296,053	I	,,	1/3·30	1/3·30	Do. 8 p.c. Pref	22/—24/-	...	...
1,775,005	Stk.	Feb. 3	5	5	Commercial Ord.	97—102	...	99
620,000	,,	June 8	3	3	Do. 3 p.c. Deb. ...	84—89	...	...
286,314	,,	Feb. 17	5	5	Do. 5 p.c. Deb. ...	120—125	...	...
807,560	,,	,,	7	7	Croydon sliding scale ...	160—165	...	161—164
644,590	,,	,,	5	5	Do. max. div.	115—120	...	119
620,385	,,	June 22	5	5	Do. 5 p.c. Deb.... ...	121—126	...	...
239,000	,,	Feb. 3	5	5	East Hull Ord. 5 p.c.... ...	107—110	...	...
184,555	,,	Feb. 17	6	6	East Surrey Ord. 5 p.c. ...	130—135	...	...
176,211	,,	June 8	5	5	Do. 5 p.c. Deb. ...	120—125	...	...
19,284,128	,,	Feb. 3	5⅜	5⅜	Gas Light & Coke 4 p.c. Ord.	27/6—28/6a	...	28/—28/6
2,600,000	,,	,,	3⅛	3⅛	Do. 3½ p.c. max.	90—93	...	91—92
4,477,106	,,	,,	4	4	Do. 4 p.c. Con. Pref. ...	105—109	...	107½—108
8,602,497	,,	May 18	3	3	Do. 3 p.c. Con. Deb. ...	87—90	...	88½—89½
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	116—119	...	118½—119
3,500,000	,,	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	114—117	...	116—116½
700,000	,,	...	...	...	Do. 3½ p.c. Red. Deb. ...	102½—104½	...	...
270,466	,,	Feb. 17	6	6	Harrogate New Cons. ...	130—135	...	...
157,500	I	Mar. 16	1/7½	1/7½	Hongkong & China, Ltd. ...	1 3/8—1 7/8	...	...
213,200	Stk.	Mar. 2	6	6	Hornsey Con. 3½ p.c. ...	135—140	...	...
5,600,000	,,	May 18	8	12	Imperial Continental Cap. ...	152—162	−8	156—162½
223,130	,,	July 20	3½	3½	Do. 3½ p.c. Red. Debs.	91—96*	...	...
285,242	,,	Feb. 17	8½	8½	Lea Bridge 5 p.c. Ord. ...	175—180	...	...
165,736	,,	Mar. 16	8	10	Maidstone 5 p.c. Cap. ...	180—190	...	...
63,480	,,	June 22	3	3	Do. 3 p.c. Deb. ...	80—85	...	...
75,000	,,	May 18	†10	†10	Malta & Mediterranean ...	195—205	...	...
392,000	—	Apl. 1	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb.	102—107	...	...
231,978	Stk.	Feb. 17	5	5	M.S. Utility 'C' Cons. ...	110—115	...	...
818,657	,,	,,	4	4	Do. 4 p.c. Cons. Pref.	103—108	...	...
360,075	,,	June 22	4	4	Do. 4 p.c. Deb. ...	103—108	...	...
148,955	,,	,,	5	†5	Do. 5 p.c. Deb. ...	122—127	...	...
125,000	—	July 1	3½	3½	Do. 3½ p.c. Rd. Rg. Bds.	97—100	...	...
675,000	Stk.	June 22	†3	†6	Montevideo, Ltd.	68—73	...	...
225,000	,,	Feb. 17	7½	7½	North Middlesex 6 p.c. Con.	172—177	...	...
396,160	,,	Feb. 3	5	5	Northampton 5 p.c. max. ...	110—115	...	...
300,000	,,	Apl. 20	†9	†7	Oriental, Ltd....	165—170	...	...
416,617	,,	June 8	8	8	Plymouth & Stonehouse 5 p.c.	168—173	+5	168½—172
504,416	,,	Feb. 3	8½	8½	Portsmouth & Gosport Cons.	170—175	...	...
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	110—115	...	...
73,350	,,	Feb. 17	...	5	Do. 5 p.c. Pref. ...	118—123	...	...
114,000	,,	July 20	5	5	Preston 5 p.c. Pref.	110—115*	...	...
355,698	I	Apl. 20	1/-	1/-	Severn Val. Gas Cor. Ld. Ord.	21/—23/-	...	...
454,510	I	Mar. 16	-/10⅛	-/10⅛	,, ,, 4½ p.c. Cum. Pref.	21/—23/-	...	21/9
133,201	Stk.	Feb. 17	8⅛	5	Shrewsbury 5 p.c. Ord. ...	147—152	...	...
90,000	10	June 8	†3⅛	†4	South African...	4—5	...	...
1,106,173	I	May 4	1/2⅞	1/2⅞	South East'n Gas Cn. Ld. Ord.	26/—28/-	...	...
845,511	I	Mar. 16	-/10⅛	-/10⅛	Do. 4½ p.c. Red. Cum. Pref.	21/—23/-	...	...
200,000	I	,,	4	4	Do. 4 p.c. Cum. Pref. ...	20/9—21/9	...	...
450,000	Stk.	Feb. 17	4	4	Do. 4 p.c. Red. Deb. ...	101—104	...	...
6,709,895	,,	Feb. 3	5	6⅛	South Met. Ord.	125—128	+2	125½—127
1,135,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf....	145—150	...	...
850,000	,,	,,	4	4	Do. 4 p.c. Irred. Pf....	104—107	...	...
1,895,445	,,	June 22	3	3	Do. 3 p.c. Deb. ...	87—90	...	88—89½
1,000,000	,,	July 6	5	5	Do. 5 p.c. Red. Deb.	113—116	...	116½
1,543,795	,,	Feb. 3	6	6	South Suburban Ord. 5 p.c....	131—136	...	133½—135
512,825	,,	,,	5	5	Do. 5 p.c. Pref....	122—127	...	...
500,000	,,	,,	4	4	Do. 4 p.c. Pref....	103—108	...	105½—106½
888,587	,,	June 8	5	5	Do. 5 p.c. Deb....	121—126	...	...
250,000	,,	,,	4	4	Do. 4 p.c. Deb....	102—107	...	...
427,859	I	May 4	9⅜	1/2½	S. Western Gas & Water Ord.	21 6—23/6	...	22/4½—23/-
160,523	I	Apl. 20	...	-/10⅛	Do. 4½% Red. Cum. Pref.	21 —23/-	...	...
110,000	Stk.	June 22	4	4	Do. 4% Red. Deb. ...	100—105	...	...
647,740	,,	Feb. 3	5	5	Southampt'n Ord. 5 p.c. max.	115—120	...	...
121,275	,,	June 8	4	4	Do. 4 p.c. Deb.	100—105	...	...
350,000	,,	Feb. 3	5½	5½	Swansea 5½ p.c. Red. Pref. ...	111—116	...	...
106,000	,,	June 8	6⅞	6⅞	Do. 6½ p.c. Red. Deb. ...	98—101	...	...
94,000	,,	,,	...	...	Do. 3½ p.c. Red. Deb. ...	95—100	...	...
1,076,490	,,	Feb. 17	6¾	6¾	Tottenham and District Ord.	150—155	...	153—154½
409,835	,,	,,	5⅞	5⅞	Do. 5½ p.c. Pref....	130—135	...	133½—134½
62,235	,,	,,	5	5	Do. 5 p.c. Pref. ...	122—127	...	...
371,850	,,	June 8	4	4	Do. 4 p.c. Deb. ...	102—107	...	...
369,774	,,	Feb. 3	7	7	Uxbridge, &c., 5 p.c. ...	154—159	+1	159
108,330	,,	,,	5	5	Do. 5 p.c. Pref. ...	122—127	...	...
1,340,521	,,	Feb. 3	7	7	Wandsworth Consolidated ...	159—164	...	162—163½
1,371,373	,,	,,	5	5	Do. 5 p.c. Pref. ...	122—127	...	124
500,000	,,	...	...	...	Do. 4 p.c. Pref. ...	104½—106½	...	105⅝—106
1,317,964	,,	June 8	5	5	Do. 5 p.c. Deb. ...	123—128	...	...
338,300	,,	,,	4	4	Do. 4 p.c. Deb. ...	103—108	...	...
499,735	,,	Feb. 17	6¾	7¼	Watford and St. Albans Ord.	155—160	...	159½
200,000	,,	,,	5	5	Do. 5 p.c. Pref. ...	120—125	...	...
200,000	,,	,,	5⅛	5⅛	Do. 5½ p.c. Pref. ...	133—138	...	...
200,000	,,	June 22	4	4	Do. 4 p.c. Red. Deb.	100—105	...	...
100,000	,,	,,	...	3½	Do. 3½ p.c. Red. Deb.	99—102	...	...
158,400	,,	Mar. 2	5	6b	Winchester W. & G. 5 p.c. Con.	122—127	...	...

a.—The quotation is per £1 of Stock. b.—Paid £3, including 10s. on account of back dividends. * Ex div.
† Paid free of income-tax. ‡ For year.

Stock and Share List continued overleaf.

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STOCK AND SHARE LIST—Cont.

Stocks Officially Quoted on Provincial Exchanges

Issue. £	Stock or Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations. Aug. 7	Rise or Fall on Week.	Transactions, Lowest and Highest During the Week.
BRISTOL EXCHANGE.								
347,756	Stk.	July 20	6	5	Bath Cons.	122½—124½*	...	...
1,667,250	,,	July 6	5	5	Bristol, 5 p.c. max.	121—122	...	...
120,420	,,	June 8	4	4	Do. 1st 4 p.c. Deb. ...	101½—103½	...	...
217,870	,,	,,	4	4	Do. 2nd 4 p.c. Deb. ...	101½—103½	...	...
328,790	,,	,,	5	5	Do. 5 p.c. Deb.	124—127	...	...
274,000	,,	Feb. 17	5	5	Newport (Mon.) 5 p.c. max. ...	111—116	...	...
13,200	12	Mar. 16	7	8½	Pontyp'l Gas & W. 10 p.c. 'A.'	14—15	...	...
13,600	10	,,	5	6	Do. 7 p.c. B.'	11½—12½	...	...
40,000	10	,,	5	6	Do. 7 p.c.' C.'	11½—12½	...	...
140,778	Stk.	Feb. 17	5	5	Weston-super-Mare Cons. ...	113—115	...	...
64,338	,,	June 22	4	4	Do. 4 p.c. Deb.	96½—98½	...	...
33,340	,,	,,	7½	7½	Do. 7½ p.c. Deb.	163—166	...	...
LIVERPOOL EXCHANGE.								
157,150	Stk.	Feb. 3	5	6½	Chester 5 p.c. Ord.	109—114	...	...
92,500	,,	June 8	4	4	Do. 4 p.c. Pref.	98—102	...	...
32,540	,,	,,	3½	3½	Do. 3½ p.c. Deb. ...	90—95	...	...
41,890	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	99—103	...	...
2,167,410	,,	Feb. 17	6	6	Liverpool 5 p.c. Ord. ...	135—137	+1	136
245,800	,,	June 22	5	5	Do. 5 p.c. Red. Pref ...	103—108	...	...
306,083	,,	July 6	4	4	Do. 4 p.c. Deb. ...	104—106	...	...
106,280	,,	July 20	10	10	Preston 'A' 10 p.c. ...	198—208*	...	...
189,219	,,	,,	7	7	Do. 'B' 7 p.c.	137—147*	...	...
NEWCASTLE EXCHANGE.								
122,877	Stk.	Mar. 2	8	8	Blyth 5 p.c. Ord.	154—156	...	...
732,000	,,	Feb. 3	5	5	Hartlepool G. & W. Cn. & New	120—122	...	...
2,061,315	,,	Feb. 3	5	5½	Newcastle & Gateshead Con.	27/—27/6a	...	...
692,856	,,	,,	4	4	Do. 4 p.c. Pref. ...	105—106	...	...
776,706	,,	June 22	3½	3½	Do. 3½ p.c. Deb. ...	99—101	...	...
277,285	,,	May 4	5	5	Do. 5 p.c. Deb. '43...	103—104	...	...
209,820	,,	Mar. 2	8½	8½	South Shields Con.	174—176	...	...
299,542	,,	Feb. 3	6	6	Sunderland 6 p.c. max. ...	129—131	...	...
NOTTINGHAM EXCHANGE.								
542,270	Stk.	Feb. 17	7	10	Derby Con.	176—186	...	...
55,000	,,	June 22	4	4	Do. 4 p.c. Deb.	100—105	...	...
84,750	,,	Feb. 17	5	12	Long Eaton 'A' Ord. ...	175—185	...	...
50,000	,,	,,	4	10	Do. 'B' Ord. ...	130—140	...	...
20,000	10	June 8	5	5	Do. 5 p.c. Pref. ...	10—12	...	...
80,000	Stk.	,,	5	5	Do. 5 p.c. Deb. ...	117—122	...	...
SHEFFIELD EXCHANGE.								
10,000	Stk.	Feb. 17	10	10	Great Grimsby 'A' Ord. ...	220—230	...	...
6,500	,,	,,	10	10	Do. 'B' Ord. ...	220—230	...	...
79,000	,,	,,	10	10	Do. 'C' Ord. ...	205—215	...	...
1,806,339	,,	Feb. 17	6	6	Sheffield Cons.	146—148	...	...
95,000	,,	July 6	4	4	Do. 4 p.c. Deb.... ...	99—101	...	...

a The quotation is per £1 of Stock.

Supplementary List of Stocks and Shares not Officially Quoted

202,152	Stk.	...	...	...	Ascot Ord.	119—124	...	...
128,182	,,	July 6	...	5	Do. 5 p.c. Pref.	115—120	...	...
238,631	1	June 8	5	5	Assd. Gas and Water Ord. ...	21/—23/-	...	...
323,681	1	,,	4½	4½	Do. 4½ p.c. Cum. Pref. ...	21/6—23/6	...	...
150,000	Stk.	...	...	...	Do. 3½ p.c. Red. Deb. ...	...	...	...
17,000	,,	Feb. 17	8	8	Bognor Orig. Ord. 'A' ...	175—185	...	...
62,210	,,	,,	8	8	Do. New Addl. 'A' ...	175—185	...	...
87,168	,,	,,	7	7	Do. New 7 p.c. max. ...	145—150	...	...
37,440	,,	Feb. 3	10	10	Cam.Univ. & Town 10 p.c.max.	210—220	...	...
125,970	,,	,,	7	7	Do. 7 p.c. max.	158—163	...	...
39,025	,,	,,	5	5	Do. 5 p.c. max.	108—113	...	...
65,000	,,	Mar. 2	7½	8½	Eastbourne 'A' 5 p.c. ...	170—175	...	...
198,000	,,	,,	6	7	Do. 'B' 3½ p.c.	142—147	+2	143½
112,312	,,	,,	5	5	Do. 5 p.c. Pref.	120—125	...	...
130,000	,,	June 22	5	5	Do. 5 p.c. Deb.	124—129	+2	127½
250,000	1	June 22	4	6	Gas Consolidation Ord. ...	20/—22/-	...	...
250,000	1	May 18	4	4	Do. 4 p.c. Red. Cum. Pref.	19/—20/	...	19/9
24,000	30	Feb. 3	8½	8½	Great Yarmouth 8½ p.c. max.	52—57	...	...
59,400	30	,,	7½	7½	Do. 7½ p.c. max.... ...	42—45	...	...
51,160	Stk.	June 8	5½	5½	Do. 5½ p.c. Deb.... ...	123—128	...	...
152,600	,,	Mar. 2	8	8	Guildford Cons.	185—195	...	...
54,055	,,	,,	5	5	Do. 5 p.c. Pref.	114—119	...	...
68,250	,,	June 8	5	5	Do. 5 p.c. Deb.	120—125	...	...
156,600	,,	Feb. 3	7½	7½	Hampton Court Cons. ...	173—178	...	...
81,660	10	Feb 4,'35	5	9	Leatherhead Ord.	16—17	...	...
107,960	10	Mar. 16	4	5½	Mid Kent Ord.	10—11	...	...
230,940	Stk.	Feb. 17	10	10	Oxford & District Ord. ...	210—220	...	...
47,112	,,	,,	5	5	Do. 5 p.c. Pref.	118—123	...	...
50,000	,,	,,	6	6	Do. 6 p.c. Red. Pre ...	113—118	...	116½
126,193	,,	May 18	7½	7½	Peterborough Ord.	160—170	...	...
64,990	,,	Mar. 16	6½	7½	Redditch Ord.	135—140	...	...
166,850	,,	Feb. 17	7	9	Romford Ord.	170—180	...	...
60,000	,,	,,	4	4	Do. 4 p.c. Pref.	97—100	...	...
44,000	,,	Mar. 16	5	5	Do. 5 p.c. Deb.	122—127	...	...
10,950	,,	Mar. 2	8	8	Ryde Ord.	165—170	...	...
136,191	,,	Feb. 3	5	7	Scarborough Ord.	128—138	...	...
27,825	,,	Feb. 3	8	8	Shanklin & Ventnor Cons. ...	152—162	...	...
40,643	,,	Mar. 2	7	7	Slough Ord.	147—152	...	...
221,000	,,	June 22	5	5	Do. 5 p.c. Deb.	116—121	...	...
28,872	1	May 4	5½	5½	S. Midland Gas Cpn.Ltd. Ord.	20/—22/-	...	...
28,866	1	Mar. 16	4½	4½	Do. 4½ p.c. Red. Cum Pref.	20/—22/-	...	...
137,730	Stk.	Feb. 17	7	7	Southgate & Dist. 7 p.c. max.	153—158	...	...
62,500	,,	,,	5	5	Do. 5 p.c. Pref.	115—120	...	...
117,228	,,	Mar. 2	5	6	Swindon Cons.	111—116	...	...
60,425	,,	June 22	5	5	Do. 5 p.c. Deb.	120—125	...	...
64,380	,,	June 8	5	5	Torquay and Paignton 5 p.c. Pf.	117—122	...	...
50,000	1	Mar. 30	...	5·52d. a	Utd. Kingdom Gas Cpn. Ord.	21/—22/-	...	21/7½—22/-
769,910	1	,,	2½	2½	Do. 4½ p.c. Prefd. Ord....	20/—22/-	...	...
110,910	1	May 18	2½	4½	Do. 4½ p.c. Cum. Pref. ...	21/3—22/3	...	21/10½—22/3
900,000	Stk	Mar. 16	...	3½	Do. 3½ p.c. Red. Deb. ...	98—101	...	102
130,000	,,	Feb. 3	5	8	Wakefield Ord.	140—145	...	...
81,650	,,	,,	5	5	Do. 5 p.c. max.	105—110	...	...
82,000	,,	July 20	6	6	Waymouth Ord.	105—110*	...	...
98,384	,,	Feb. 3	6	6	Wolverhampton 6 p.c. Pref.	127—132	...	...
160,000	,,	June 8	5½	5½	Do. 5½ p.c. Rd. Db	107—112	...	...
370,000	,,	July 20	6	4	York Cons.	105—110*	...	...
90,000	,,	June 22	5	5	Do. 5 p.c. Red. Deb. ...	103—108	...	...
133,640	,,	July 20	6½	6½	Yorktown (Cam.) 5 p.c. Cons.	130—135*	...	...
120,000	,,	,,	5	5	Do. 5 p.c. Pref.	118—123*	...	...
35,000	,,	June 22	5½	5½	Do. 5½ p.c. Deb.... ...	130—135	...	...

a Actual.

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